

INDIA RUBBER WORLD

JUNE 1, 1928

Afterwards?

After selling prices are adjusted to current market levels—and the consequent inventory write-off has been absorbed—

Then What?

Competition will be keener, profits lower than ever before.

In this highly speculative market a slight advance in the cost of crude will wipe out whatever profits exist.

There is a valuable aid at hand to meet this condition.

Buffalo Reclaims

No inventory losses.

No large cash outlay.

No long-term commitment risk.

There is a Buffalo reclaim for every use.

Use them to meet every class of price or quality competition.

U.S. RUBBER RECLAIMING CO. Inc.

100 East 42 St. N.Y.

Factory Buffalo, N.Y.

45 Years Serving the Industry—



Solely as Rubber Reclaimers

DOMINION RUBBER COMPANY LIMITED

Formerly CANADIAN CONSOLIDATED RUBBER COMPANY, LIMITED

Executive Offices—MONTREAL, CANADA

Chairman, CHARLES B. SEGER

President, W. A. EDEN



Canada's largest manufacturers of Rubber Goods, including: Rubber Footwear, Automobile and Bicycle Tires, Mechanical Rubber Goods, Rubber Covered Rolls, Druggists' Rubber Sundries, Moulded Rubber Specialties, Rubber Soles and Heels, Rubber-Sole Canvas Shoes.

Twelve manufacturing plants. Twenty service branches in the leading cities throughout Canada.

CLIFTON RUBBER CLOTHING

COATED GEM DUCK and SHOE CLOTH

FRICTION TAPE
AND
SPlicing COMPOUNDS

CLIFTON MANUFACTURING CO.
65 Brookside Ave. BOSTON, MASS.

"PAHRAH" RECLAIM HIGH TENSILE LOW GRAVITY

Bloomington Rubber Co.

ESTABLISHED 1879

501 Fifth Avenue New York, N. Y.

Established in 1856

Telephone 3940 Bowling Green

H. HENTZ & CO., COMMISSION MERCHANTS

Hanover Square

Cotton Exchange Building

New York

Execute Orders For Future Delivery

CRUDE RUBBER

ON

The Rubber Exchange of New York, Inc.

The Rubber Trade Association of London

WE INVITE YOUR INQUIRIES REGARDING METHODS OF TRADING IN COMMODITY FUTURES

Members of

New York Cotton Exchange
New York Stock Exchange
New York Coffee & Sugar Exchange, Inc.
New Orleans Cotton Exchange

Rubber Exchange of New York, Inc.
New York Produce Exchange
Chicago Board of Trade
Winnipeg Grain Exchange

Associate Members of

Liverpool Cotton Association

BETHLEHEM, PA. BOSTON, MASS. DETROIT, MICH. SAVANNAH, GA. PARIS, FRANCE

N

.

M

D.

Y.

INDIA RUBBER WORLD

Published at 420 Lexington Avenue, Graybar Building, New York, N. Y.

Volume 78

NEW YORK, JUNE 1, 1928

Number 3

Guayule Rubber a Home Industry

Recent Findings by Dr. D. Spence Show that Guayule Rubber is a Colloidal Suspension in the Plant Juices Like Latex of the Hevea Tree—Important Developments Follow

VINCENT SAUCHELLI

RUBBER growing within the confines of the United States is nearer a reality than most people suspect. We have heard so much about America growing its own rubber and of the efforts of some of our tire manufacturers in developing their own plantations in tropical areas abroad, that it comes almost as a surprise to learn of the success of growing real rubber right here on our own domain. The announcement made by the Intercontinental Rubber Co. through its chemical research department at the April meeting of the New York Group of the Rubber Division of the American Chemical Society, marks a great triumph in this company's persistent and careful investigation of growing guayule rubber on United States soil. The outstanding recent discovery in connection with guayule rubber is the fact that the rubber does not exist in the cells of the shrub in the form in which it is recovered but in the form of a colloidal suspension in the plant juice. This is quite contrary to what was generally believed. The practical significance of this discovery is far reaching. Now it is possible to plan on improving the physical and chemical quality of the rubber, where before the possibility was rather discouraging.

Another very practical discovery of tremendous influence in the preparation of a high quality rubber is the fact that by a process of retting of guayule shrub, much like the retting of flax, it is possible to reduce the resin of guayule rubber, as represented by the acetone extract, from 25 per cent to 10. The physical properties of the vulcanized rubber become so improved that the tensile strength may be almost doubled. These results, as described by Dr. Spence in the paper forementioned, are astounding.

Research Program Leads to Discoveries

Guayule is often referred to as a resinous rubber. Plantation rubber from the Hevea tree contains from 1.5 to 2.5 per cent resins; Castilloa rubber, from 3 to 7 per cent;



Dr. David Spence

African wild rubber, from 4 to 10 per cent; and guayule, from 20 to 25 per cent. These represent very general analyses. The acetone extract is considered the resinous content. The presence of resins in the crude rubber is a serious drawback. One of the reasons why Para rubber has captured the world markets is its very low resin content. Hence we see the remarkable gain made by the guayule investigators in reducing the high resin content of their product to about 10 per cent—a reduction of nearly 60 per cent of the total resins. The simple way this has been accomplished is interesting. It was found that the guayule shrub was composed of the following elements:

1. Water soluble: Tannins, carbohydrates and some nitrogen containing substances.
 2. Water soluble after hydrolysis, that is after having become disintegrated by the action of water: The materials which make up the middle layer of the cell walls; and protein-like substances hard to dissolve or be acted upon by water (by far the largest part of the plant constituents).
 3. Insoluble in water: Cellulose or fibrous structures of the plant; the true resins and resin acids.
- About 10 per cent of the plant constituents are water soluble; about 15 per cent are water soluble only after hydrolysis. Now, here is where a clever observation led to a very practical result. It was suggested to let these constituents decompose by fermentation which would then reduce the amount of products that became bound up in the rubber in its milling and which were responsible to a great extent for the high acetone extract and other deficiencies of guayule rubber. Right here it must be stated that the acetone extract of this rubber is only in small part truly resinous; the rest is made up of the forementioned water insoluble substances. By causing them to be decomposed by fermentation, these substances change to sugars, organic acids, and carbon dioxide; while their protein portion putrefies and

splits up into less obnoxious elements. Thus a retting of the guayule shrub, previous to milling, reduces the acetone extract of the rubber by 60 to 70 per cent and improves the vulcanizing properties of the rubber by 30 per cent. This remarkable discovery is made use of now in the preparation of guayule and saves on the expensive and troublesome operation of extracting the rubber by acetone. "Ampar" recently put on the market is a brand of guayule prepared after this manner.

Other less obviously important results from a layman's point of view derive from the discovery of the way the rubber exists in the plant. Heretofore, the general belief was that the rubber occurred as such in the root, stem and branches of the shrub. Maceration of the dried plant agglomerated the rubber globules and the residual woody portions were washed away. But biochemical investigation now reports that the rubber exists in the plant juices in the form of a colloidal suspension. They have been able to demonstrate the presence of the fine, microscopic rubber suspension within individual cells by means of high-powered microscopes. This discovery was more potent than any other consideration to justify the hope that by suitable research it would be possible to improve very largely the physical and chemical quality of the guayule type of rubber. For it is in this very same form that rubber occurs in the latex of that premier plantation tree, the *Hevea brasiliensis*, which makes up the vast producing areas of the Far East. Subsequent results have proved the early hope was well founded. This discovery has been and promises to be even more fruitful of far-reaching industrial improvements.

The Research Work by McCallum

Tied up very intimately with these advances and improvements on the chemical and biochemical phases of the research is the excellent work accomplished by Dr. McCallum. With infinite patience and perseverance, over a period of seventeen years and more, he pursued his botanical and biological studies until he was able to develop and to propagate suitable strains of guayule that would respond to intensive cultivation. One problem he set out to solve, and did, was to propagate a suitable strain from seed. At first he had difficulty in getting his seed to germinate. He finally discovered a way of chemically treating the seed to stimulate and control the germinating power. He now gets 100 per cent germination.

The remarkable achievement of McCallum has been applauded in scientific circles. The public-at-large should know of this tireless worker's record. What he has found out about the guayule shrub is now accepted as of fundamental importance in any study of the effect of environment upon growth. There are countless varieties of guayule. To study the more important strains and to isolate those which would combine both high rubber low resin content, with adaptability to specially controlled growth conditions was an enormous task. The fruit of his labors is evident when we read in a recent announcement of the California papers the following: "Guayule planting is gradually ex-

panding in California. Approximately 1,800 acres have been transplanted in February, 1928, on land leased or supplied by the owners under so-called profit-sharing contracts. Automobile tires manufactured from California grown rubber alone have been made and satisfactorily tested." And again, this item: "American Rubber Producers, Inc., has leased 100 acres of the Irvine Ranch in Orange county and has begun the planting of 400,000 shrubs brought from the Salinas nursery. This same company recently started a similar plantation at Santa Maria."

The tale of what has been done to make guayule an American home-grown crop is truly fascinating. Huge problems had to be faced, and fundamental research involving every major branch of science had to be prosecuted in the face of discouraging odds. All the experimental work has been done by private initiative and private capital. The Intercontinental Rubber Co. is the parent organization that has made possible this achievement. They have laboratories, factories and plantings in Mexico and a fine experimental unit in California.

No less important than the purely chemical and biological research has been the energy and ingenuity to make

the preparation of the soil, seeding, transplanting and harvesting,—in short, every operation of the guayule industry, mechanical. The object has been to develop machines to do every bit of the work connected with this industry. Success is also reported in this phase of the research. It may not be necessary to mechanize the industry in the cheap labor districts of Mexico; but, if the industry is to expand in the southern states of our country, and compete with the coolie grown plantation rubber of the Orient, labor-saving devices take on an important competitive value.

As now developed, the production of guayule rubber within continental United States, from seeding to production of finished goods, is a continuous mechanized series of operations using the very minimal amount of man power. That means progress and a boon to our domestic industry.

Cord Impregnating Limits

Supplementing statements made in INDIA RUBBER WORLD and other journals concerning the use of raw or vulcanized latex in treating tire cord, Dr. Philip Schidrowitz says that, despite differences of opinion as to the advantages of "soaking" or spreading with "solution," or frictioning, he is still unconvinced of the superiority of latex impregnation or that latex can be made to penetrate a cord or a thread any more than can a rubber solution. He refers to a long series of experiments in impregnating with latex (on fabric) using vacuum and pressure under a variety of conditions, and in which the results were always the same—that the rubber was deposited on the surface of the thread but not forced into the interior. Whether vacuum or pressure, or both, were used the result was the same, the rubber was filtered out. Some hold, he says, that rubber in a cord or cord fabric is wanted only as a cord insulator and as a cementing agent; and that excess of rubber does not improve the mechanical qualities and may even lessen the life of a casing.



Dr. W. B. McCallum with a 4-Year-Old Guayule Plant

Rubber Compounding Ingredients

Organic Colors for Rubber Goods—Fundamental Color Factors—Matching Colors—Lakes and Toners—Color Characteristics—Choice of Accelerators—Colors in Vulcanite—Advantages of Organic Colors

WEBSTER NORRIS

UNTIL about fifteen years ago the rubber goods industry was limited for colors to a few dull and uninteresting metallic oxide and sulphide pigments because no others could withstand curing conditions. The color situation is now completely altered by the curing conditions brought about by the use of accelerators. Vulcanization in every line of rubber goods is now possible at temperatures in which the organic colors prepared for rubber work remain unchanged. This development of the new curing practice has been followed by the introduction from the textile dye industry of a very extensive selection of organic colors perfected especially for rubber work. Thus, color schemes never before available are now used in weather proofed clothing, footwear, bathing accessories, novelties, etc., and artistic color effects are now combined with stylish design, fit and utility, to make a stronger sales attraction for the goods. As a result there is renewed popular interest in snappy gayly colored rubber goods which harmonize with modern ideas of decoration while serving the same practical value as when offered in dull colors.

Unlike inorganic color pigments, organic colors rarely are other than neutral toward the ingredients of a rubber mixing. This fact and the limited amount of color required to produce the desired color tone enables the compounder to arrange his formula for definite time and temperature of curing without consideration of the organic color content other than its tinctorial value. The present extensive variety of colors requires for its best application that the compounder be conversant with the elemental characteristics of color for the use of color is an art calling for knowledge beyond intuition. A wide variety of shades can be produced in rubber using only one

coloring material, by varying the percentage of color, white pigment and black pigment. And an infinite range of color effects can be obtained by using only the six so-called primary and secondary colors.

The three fundamental factors which enter into color are hue, brightness and saturation:

1. Hue is the predominant wave length emitted by the coloring material under consideration, that is, the hue determines the position of the color in the spectral scale.

2. Brightness is the percentage of the incident light which is reflected, that is, a very brilliant white body approaches 100 per cent in brightness while jet black approaches zero, although it should be noted that all blacks reflect some light and all whites absorb a little.

3. Saturation is the percentage of reflected light which is colored.

A thorough understanding of these terms is so essential in matching colors, that a fuller explanation is given.

Hue

The hue is a fundamental property of color and is usually only slightly changed by the compound in which it is used. Most rubber compounds which contain no black pigment or black reclaimed rubber, are brown and therefore have a tendency to shift the hue toward yellow. This tendency is almost unnoticeable in compounds containing no reclaim, on account of the low saturation of the yellow, but compounds containing "gray" reclaim always decrease the brightness of the color and sometimes shift the hue noticeably toward the yellow. Hue is constant regardless of the color or of the white pigment used.

Brightness

When white light strikes any surface, some of it is absorbed and the rest is reflected. The percentage which is reflected is the measure of brightness.

RED INNER TUBE	
Pale crepe	100.00
Sulphur	2.25
Zinc oxide	3.00
Accelerator D. O. T. G., 9 oz.	0.55
Blanc fixe (5 volumes)....	23.75
Orange Y O	0.5

Cure 45 minutes at 287° F.

COMPOUNDED GREEN STOCK	
Pale crepe	100.00
Sulphur	2.25
Zinc Oxide.....	3.00
Accelerator D. O. T. G., 9 oz.	0.55
Barytes	151.50
Green G. L.	10.00

Cure 45 minutes at 287° F.

Recommended by E. I. du Pont de Nemours & Co.

BASE FORMULA FOR MOLD OR OPEN STEAM CURE

Rubber	100.00
Zinc oxide	5.00
Lithopone	5.00
Sulphur	2.25
Accelerator, A-20.....	1.00
Color, amount and kind desired,	
Open steam cure 30 minutes at 287° F. excluding rise.	
Press cure, 40 minutes at 287° F. for normal thickness.	

COLOR VARIATIONS ON ABOVE

Brilliant red add one part Red No. 1.	
Deeper red add one part Red No. 9, Maroon No. 113 or Red 29.40.	
Blue-green add one part Green No. 1 or Green No. 3.	
True green add one part Green No. 15 (press cure only) or use Green No. 1 or Green No. 3 with a little yellow.	
Light Blue add one part Blue No. 7.	
Deeper blue add one part Blue No. 3 (or Fast Blue may be used in press and hot air cure with accelerators other than A-20).	
Violet add one part of Violet No. 1.	
Yellow add one part of Yellow No. 8.	
A brilliant yellow add one part Yellow No. 4.	

Recommended by Rubber Service Laboratories Co.

HIGH GRADE RED SHEET

Pale crepe.....	65
White factice	5
Whiting	18
Lithopone	10
Rubber Red 6B	2
	100

Vapor cure.

CANARY YELLOW STOCK

Pale crepe	20
White factice	10
Whiting	43
Lithopone	25
Yellow R R	2
	100

Acid cure.

WATER BOTTLE OR SYRINGE BAG

Smoked sheets	35.00
Zinc oxide	4.00
Lithopone	4.00
Barytes	12.00
Chalk whiting	30.25
Magnesium carbonate.....	1.00
Stearic acid	0.50
Red No. 329	2.00
Sulphur	0.75
Accelerator A-20	0.5
Ground red sundries scrap	10.00
	100.00

Mold cure in press 7 minutes at 320° F.

HEAVILY COMPOUNDED BRILLIANT YELLOW STOCK

Smoked sheets	31.00
Zinc oxide	3.00
Whiting	58.00
Lithopone	3.00
Sulphur	0.75
Cycline oil	2.00
Accelerator A-20.....	0.50
Yellow No. 4	2.00
	100.25

Non bloom open steam cure 15 minutes at 298° F.
Non bloom press cure 18-20 minutes at 298° F.

Copyright, 1928, by Webster Norris. Continued from INDIA RUBBER WORLD, May 1, 1928, pp. 55-57.

A certain percentage of the reflected light is deprived of most of its wave lengths excepting those in a narrow range, which produce the sensation of color. The percentage is called the saturation; and the portion of the spectrum which is reflected determines the hue. The remainder of the light striking the body is reflected as white light, that is, without change in the proportion of the different wave lengths present. In compounding colored rubber stocks, one should observe the fundamentals discussed in the succeeding paragraphs.

The saturation of a pigment is decreased and the brightness increased by the addition of a white pigment.

The brightness of a pigment is decreased and its saturation unchanged by mixing with it a neutral black pigment.

The dominant hue of a pigment may be changed by mixing with it another pigment, that is, mixing blue and yellow produces a sensation of green, since the predominant wave length moves to a point intermediate between that of the two original colors.

It should be noted, however, that whenever colors are mixed there is a tendency to decrease the brilliancy. The mixing of pigments corresponds to what physicists term the subtractive method of color mixture. This can be readily understood when it is considered that a neutral blue pigment emits some light waves extending into orange as well as toward green. The orange and blue are complementary, as are the violet and yellow that is, their subtractive mixture produces black. It is, therefore, clear that since the light emitted by all pigments is not of one single wave length but extends over a range, their brilliancy is decreased to some extent by mixing.

To overcome this decrease in brilliancy, we have recourse to the addition of a good white pigment, such as lithopone, which will improve the brilliancy but decrease the saturation of the color.

Saturation

The saturation of a color in the rubber product is determined mainly by the percentage of color used. A coloring material which gives a stock of high color saturation when used in low percentages is said to have high covering power.

The use of pale crepe or amber crepe rubber is recommended in compounds colored with organic lakes or toners. All grades of smoked sheets have a distinct darkening effect on the color which can, however, be almost entirely overcome by using a high percentage of color.

A few examples will illustrate these rules: Pink is a red of low saturation but high brightness. Scarlet is a red of medium saturation, high brightness and a hue somewhat toward orange. Maroon is a red of neutral or slightly violet hue with high saturation but low brightness.

Rubber compounders not familiar with color matching will do well to avail themselves of the expert laboratory assistance of organic rubber color makers in those color problems that present unusual difficulties.

Most ordinary dyestuffs are not suitable for coloring rubber, because they are destroyed by the action of sulphur, and other compounding ingredients, at the temperatures employed for the vulcanization of rubber. Other artificial dyes which

are not destroyed during vulcanization are equally useless because they bleed or bloom to the surface of rubber goods. Many colors also are unsuitable for cold curing as sulphur monochloride reacts with them, either destroying the color or materially altering the shade. Organic colors suitable for the ink, paint and varnish trades require special treatment to adapt them for use in rubber.

Lakes and Toners

A lake color is a dyestuff precipitated upon a colorless base such as aluminum hydrate, "glass white," blanc fixe or a colloidal clay preparation such as Catalpo.

Experience has shown that some organic lakes and toners are valuable rubber colors. A true lake is produced by precipitating on a mineral base the action product of a dyestuff or a dyestuff intermediate with a metallic salt or another

organic compound. Among the substances also incorrectly termed "lakes" may be mentioned minerals, whose surfaces are colored by the adsorption of a soluble dye; and inexpensive mixtures of clay, barytes, or whiting with a synthetic color. The principal shortcoming of all lakes and their modifications in rubber compounding is that their covering power is low, due to the diluting effect of the clay, alumina, or other minerals which they con-

tain. Practically all of the best rubber colors are of the class known as toners. While chemically similar to the true lakes, they are not diluted by mineral matter and therefore have far greater covering power. In the past the difficulty with this class of color was that most toners do not disperse readily and uniformly in rubber. This difficulty is overcome in some cases by precipitating the color in the presence of a protective colloid which also acts as a dispersing agent. In other instances it is obviated by carefully controlling the conditions of precipitation.

Permanence

Ordinarily, the organic colors, used in rubber are of sufficient strength that only a fraction of one per cent or slightly more is necessary to give a very pronounced color to the rubber stock. Because of the small quantity used, it is readily seen that any compounding ingredient in the rubber mix which would react or interfere with the dye, would probably destroy the color. Some organic colors are resistant to acids, others are resistant to alkali, while still others are resistant to both. A good many of the rubber colors, however, are destroyed by alkali, either in the cure or subsequent to the cure. For example, a number of rubber dyestuffs will give very satisfactory colors in tiling stocks, but cannot be used for that purpose because the strong caustic which is often used to clean floors, will destroy the color on the surface of the tiling. The ordinary steam cure, either open steam or molded is effected by a sulphur mixture held at high temperatures. Under these conditions, the color must withstand the heat, the oxidizing effect of the sulphur, and the small amount of sulphuric acid formed during the cure.

Certain organic colors contain nitrogen or nitrogen-sulphur combinations. These exhibit slight accelerating or retarding effects upon the cure. Some organic colors are soluble in the

BRIGHT RED WATER BOTTLES AND SUNDRIES		BLUE RAIN COAT	
Smoked sheets	40	Smoked sheets	30.000
Sulphur	1	Sulphur	0.750
Trimene base	4%	Ultra accelerator	0.125
Cotton seed oil	2	Degras	0.750
R-504 Bright Red	3	Zinc oxide	10.000
Barytes	18	Whiting	57.375
Zinc oxide	18	R-602 Blue	1.000
Whiting	17%		
	100		100.000
Cure 8 minutes at 287° F.		Cure 45 minutes rise to 240° F. and 45 minutes at 240° F.	
APRON STOCK		DIPPED BALLOONS	
Pale crepe	30	Blue	96
Lithopone	20	Red	96
Whiting	49½	Lithopone	5½
R-704 Brilliant Green	½	R-605 Brilliant Blue	½
		R-503 Medium Red	0 2
Vapor cure.			100 100

Recommended by J. M. Huber, Inc.

rubber, while others are not. Naturally those which are soluble migrate from one part of the stock to an adjacent part until the color concentration is uniform throughout the stock. Such colors cannot be used for two color work, nor in stocks placed next to uncolored stocks. Other organic colors have a definite solubility in rubber, and if an amount exceeding this is used it will gradually work to the surface as a bloom.

Choice of Accelerators

The choice of accelerator for compounds containing organic colors is a problem which merits careful consideration. Ethylidene aniline and accelerators of the type of Vulcone are not suitable for use in compounds containing organic colors unless a considerable percentage of white pigment is also used in order to counteract the darkening effect of the accelerator. One of the best accelerators for compounds containing organic colors is Thionex. Diorthotolyl guanidine, diphenyl guanidine, or hexamethylene tetramine may also be used in conjunction with most organic colors although the shades produced with these accelerators are not quite as bright as those obtained when accelerators of the ultra type of Thionex are used and the vulcanization is carried out at lower steam pressures.

Zinc carbonate with the rapid accelerator Thermo-F brings out the tints of organic colors more clearly than when zinc oxide is used. The accelerator known as Pip-Pip can also be used although it is somewhat expensive.

In other words accelerators that do not discolor white rubber stocks can be used successfully with organic rubber colors as there is no chemical reaction between them. As a rule anti-oxidants kill the fine effects of organic colors due to their propensity to darken in sunlight. Blacks, dark blues and other dark colors are of course not affected by any darkening effect of this sort.

Organic Colors in Vulcanite

Black for hard rubber was always considered unchangeable except in a few special instances when it was heavily loaded with vermilion, antimony sulphide or iron oxide, in which cases the valuable properties of hard rubber were considerably affected. Now, however, hard rubber can be as effectively colored with organic colors as soft rubber and in all the ordinary reds, greens, blues, yellows and browns. In this connection it should be noted that smoked sheet rubber gives clearer and brighter color values in hard rubber than pale crepe or first latex crepe. On the other hand the reverse is true of these rubbers in the case of soft rubber products.

Advantages of Organic Colors

It is possible by suitable selection from the numerous organic colors now available to produce any shade or color effect that may be desired, and in practically every type of commercial rubber mixing. Among the colors may be mentioned browns, tans, olive green, rose pinks, salmon pinks, flesh and orchid tones. These color effects are more bril-

liant than can be obtained with mineral pigments and are without limit in variety. The small amounts of organic colors necessary to give a brilliant color permit the production of highly colored stocks with very little compounding, therefore practically pure gum stocks, transparent and translucent stocks may be manufactured. The variations in hue and covering power in different production runs of organic dyestuffs are entirely negligible as compared with those of mineral colors.

In heavily compounded soft rubber products the inorganic pigments will ordinarily contribute great color value at lowest cost. But in soft goods containing a reasonable proportion of new rubber and no black reclaim, mineral rubber or asphaltic softeners, organic colors will give the greatest color value at the least volume cost. For colored dipped goods and high grade spread coated products and

fine sheet rubber, organic colors are unquestionably superior not only on account of the color cost factor per pound of rubber product but also for their dispersability in the mixing and their freedom from grit.

Curing Temperatures

The temperature of cure also has its effect upon results, not so much in its action upon the color contents as on the rubber itself. Experience indicates that about 300 degrees F. is the critical point above

which color tones very rapidly lose their value, but below which not much change is noticed except that at temperatures of 260 degrees to 270 degrees F. the highest color values are obtained. The cause of this temperature effect is unquestionably a carbonizing action upon the rubber contents, but knowing the danger point no inconvenience in producing the desired product need occur in compounding and curing for special results. Even the stronger white pigments, zinc oxide, or lithopone, refuse to retain their full whiteness if subjected to excessive curing temperature.

White lead, litharge and other lead compounds darken under vulcanizing conditions and affect color values, but with this exception all other white or light colored compounding minerals work satisfactorily.

Mineral and Organic Colors Compared

The inorganic colors while low in pound cost have high specific gravity, and being weak tinctorially do not always give the lowest ultimate compound cost compared with many organic colors of higher pound cost, low specific gravity and finer particle size. These reasons permit securing color values with a much smaller proportion of organic color at a volume cost equal to or below that afforded by the heavier pigments. Fineness of particle size is requisite for all rubber colors. The rub-out test is intended to demonstrate coloring power in full color value, but in the dry mix of rubber compounding the coarse color particles are not broken down but go into the final product in their original condition with the color distribution weakened in proportion.

Acknowledgment is made for permission to use in this article information and formulas supplied by Ault & Wiborg Co., New York; E. I. du Pont de Nemours & Co., Wilmington, Del.; Rubber Service Laboratories Co., Akron, O.; and J. M. Huber, Inc., New York.

RED BATHING CAPS		HARD RUBBER PEN STOCK	
Smoked sheets	100	Smoked sheets	100
Blanc fixe	25	Sulphur	40
Zinc oxide	5	Zinc oxide	5
Sulphur	2	Lithopone	25
Petrolatum	1	Accelerator T. P. G.	1
Tuads accelerator	0.25	Add to above mix, 14 parts of hard rubber red No. 5,314 and cure in soapstone 5 hours at 298° F. or press cure in molds 2 hours at 298° F.	
Calcutta Red	2		
Press cure 10 minutes at 290° F.			
RED RAINCOAT		HARD RUBBER PEN STOCK	
Smoked sheets	15	Smoked sheets	100
White reclaim	6	Sulphur	30
Sulphur	0.45	Zinc oxide	5
Thermo-F accelerator	0.05	Heavy calcined magnesia	5
Zinc carbonate	20	Accelerator T. P. G.	1
Chalk whitening	15	Add to above mix, 45 parts of hard rubber red Nos. 3,572 and 4,445. Cure in soapstone 5 hours at 298° F., or press cure in molds, 2 hours at 298° F.	
Bombay Red	2		
Cure 45 minutes rise to 240° F. and 45 minutes at 240° F.			
Recommended by Ault & Wiborg Co.			

The Lifting Truck in Rubber Plants

The convenience of the jack lift truck for handling materials in process in the rubber factory is effectively shown in the accompanying factory interiors



TONS of material in shapes awkward to manage are daily handled to and from the mixing mills, to storage rooms. Thence to be taken as required by truck to warmers, calenders or tubers for processing. No better or more convenient method of moving such material in mass than by the use of the lift truck which enables a workman to lift a huge pile of slabbed rubber packed upon a hollow platform and move it from place to place as indicated in this mill room view.



FIVE thousand pound capacity lift trucks are used to carry the steel platform upon which the large cable pans are fixed on a ballbearing swivel. The insulated wire is wound in and out of this large pan as it comes to and from the insulating machines, and to carry it from one process to another the lift truck is used. Operators in this plant say that the truck receives severe abuse and yet it is standing up and giving admirable service under its heavy, tippy loads.



PARTICULARLY useful is the lifting truck for handling either dry or liquid materials in kegs, barrels or drums. For this purpose small platforms are constructed of steel angles welded together and made to fit the barrel exactly. When it is desired to move them a special model single lift truck is run under the platform and the barrels thus carried away. Even an open barrel of liquid may be safely moved in this way.



INSULATION is applied so rapidly to the conductor in a wire and cable plant that curing pans must be handled to and from the insulating machines and vulcanizers with great facility. The application of the lifting truck to this problem is here pictured when one operator can pick up and transport with ease five or more of the heavy pans. Thus keeping the floor clean and stacking the pans at convenient points for supplying the needs of the work.

Kabacan---The Heart of Mindanao

The first plantation rubber to be produced on the island of Mindanao, Philippine Islands, was shipped from the Rio Grande Rubber Estate in 1925

Emmet Harris



IT seemed more than coincidence that I should have visited Zamboango just at the time I did. It was in the Spring of 1925 and while there were rumors of higher rubber prices the market for standard crepe was still around forty cents, New York. Restriction was in effect but had not yet been effective.

It was, therefore, with more than an ordinary amount of interest that I was introduced to the new owner of the only rubber plantation on the island of Mindanao. "Tommy" Wolfe is a veteran of the Spanish-American war and had been in the islands since 1898. Most of the time since then he had spent very profitably running Manila's most modern laundry. He also had an export and import business. He had heard of Kabacan, developed by a Scotch capitalist, and learning it was for sale had gotten an option on it. When I met him he had just closed the deal and was the owner of 2,500 acres of rubber land many miles in the interior of Mindanao which he had never seen. He invited me to take a few days from my regular itinerary (I was bound for Singapore, via Borneo ports) and visit his new property and I readily consented.

We started across the Celebes Sea one evening at sunset in a 300-foot coasting steamer. We slept forward on deck to avoid the chickens and other livestock of about fifty immigrants from one of the northern islands who were bound for the new colonization project near Pikit which the Filipino Government was trying to further. Late next evening we arrived at Cotabato, at the mouth of the Rio Grande River. Cotabato was the home of the Filipino governor and he greeted us and made us comfortable for the night.

A government launch was bound up river next morning and we were welcomed aboard, especially as we had brought ice and a case of soda water. All day long we steamed into the heart of America's greatest undeveloped possession. Broad fields of cogon grass waved on both sides of us and a broad plain, extending as far as the eye could reach, showed absolutely no signs of habitation or cultivation. The few Moro villages we passed seemed self-contained and subsisted on rudely cultivated plots on their outskirts. The principal diet was fish and sweet potatoes.

We passed the immense tract of land for which Hawaiian pineapple interests had been dickering with the Legislature

without success. Filipino politicians feared the investment of American capital. We were told that this was one of the most thickly populated sections of Mindanao, yet rarely did we see one of the 900,000 inhabitants of the island whose size was that of Indiana, and then never one at work!

What we did see were alligators, many of them, sunning themselves on the mud flats and offering excellent targets for our 38 Colts. We then understood the meaning of certain bamboo stakes around the village bathing places.

At Pikit we passed the night with the local constabulary while our launch, which we had left at a place several miles down the river for a trek overland made the 20-mile trip occasioned by a huge semicircular bend in the river.

Next morning we embarked again and this time the 20-foot launch had a much more dangerous and hazardous course. Sunken logs and treacherous shoals seemed everywhere and our pilot, guiding the little craft more by instinct than by reason, had some miraculous escapes. We all appreciated that a ripped hull in this current and with these alligator infested waters on all sides, would give us little chance of escape. It was somewhat with a sigh of relief, therefore, that about four-thirty we came to a bend in the river and then—Kabacan.

The Scotch manager and his wife greeted us like long lost brothers. We were the first white people they had seen in a year. Considering the inaccessibility of the place they were living in comparative comfort. A herd of some 25 "mestizo" cattle which had been put on the plantation five years before had increased to 125 head and we were treated to fresh milk and fresh eggs and other delicacies.

There were about 30,000 rubber trees on the plantation of which only 360 acres were in rubber, and the trees ranged in age from two to thirteen years. For one reason or another the older trees had never been tapped, principally because, through lack of capital, the sheeting rolls and smokehouse had never been built. Work on these had been started several months before and the first cases of smoked sheets were now ready for shipment. It was a rather proud day for America!

Rubber, of course, had been produced on the Island of Basilan, off Zamboanga for several years, but these sheets, that we watched being packed were the first to be produced on Mindanao.

Kabacan had been long coming into its own. The difficulty of transporting materials, the incursion of cogon grass, and the ubiquitous wild hog had all contrived to hinder its development. Then in 1915 a fire started in the dry cogon grass, swept the plantation and destroyed most of the trees. Since 1917 about 50 acres had been planted every year, ranging from 65 to 108 trees to the acre. A cover crop of passion vine has kept down the grass and the cattle have aided materially. Corn planted between the rows and cultivated seems more effective than passion vine, however, as a grass eliminator.

The trees showed a satisfactory growth and compared favorably with Sumatra east coast. The 6-year old trees showed an average girth of 23 inches compared with 24 inches of the Dutch trees. Moro labor is used exclusively and receives 50 cents Filipino per day of 10 hours. Tractor engineers receive 1 peso per day. From 60 to 100 men are employed on the estate. Cost of upkeep was very low as paying crops and cattle cover almost all the expenses. About 120 acres are planted to coconuts which are very profitable. The plantation seemed entirely free from disease, although tapping had not progressed far enough to ascertain whether any bark disease will develop.

We loaded our rubber cases on the launch and started down river the next afternoon, reaching Pikit at midnight after another hazardous journey. Traveling at night down jungle rivers is not the most reassuring of pastimes and we

were glad to reach the comparative comfort of a constabulary cot. The trip down to Cotabato was much quicker than the trip up. Starting at nine next morning we reached Cotabato at sunset, although the upriver journey had required nearly 36 hours against the current.

Arriving at Cotabato we were accorded somewhat of an ovation. These rubber cases, on their way to some prosaic rubber factory in America, would never again be looked upon with something akin to awe by a provincial governor! The production of these first cases of rubber, against tremendous odds, showed that American pluck and determination, could, if driven to it, rid itself of artificial restriction. There were 500,000 acres of land suitable for rubber cultivation on this island and with this fulcrum we could, if compelled to do it, pry America loose from the grip of a rubber producing monopoly.

Rubber Institute Organized by Rubber Manufacturers

The Rubber Institute has been formed by twelve leading American rubber manufacturing companies. Gen. Lincoln C. Andrews, formerly Assistant Secretary of the Treasury in charge of prohibition enforcement, is Director General of the new institute. The purposes of the organization are to place the rubber industry on a sound economic basis, to adopt a code of trade ethics and to use "conscientiously" legal, cooperative methods of sound merchandising.

The first meeting of the institute is to be held June 1, at the Hotel Plaza, New York, N. Y. Representatives of the Federal Trade Commission and the Department of Commerce are expected to be present. Headquarters will be opened at Columbus Circle following incorporation of the organization.

Every rubber goods manufacturer in the United States is to be asked to become a member of the institute. The concerns which now comprise the organization are the Ajax Rubber Co., Dunlop Tire & Rubber Co., Firestone Tire & Rubber Co., the Fisk Rubber Co., The B. F. Goodrich Rubber Co., Goodyear Tire & Rubber Co., Kelly-Springfield Tire Co., Manhattan Rubber Mfg. Co., Miller Rubber Co., Seiberling Rubber Co., United States Rubber Co. and the Hood Rubber Co.

The Rubber Institute will have nothing to do with purchasing, as an institution, but will deal with handling the manufactured product. It will be similar to the Cotton Textile Institute and to organizations of that kind in the sugar, wool and alcohol industries. The institute will be wholly independent of the Rubber Association of America, but will act cooperatively.

Neither Dearth nor Dearthness

Guessing the future price of crude rubber is as popular an indoor sport as ever, and the estimates of cost and volume of supply even by experts are varied enough to suit all tastes and hopes. Perhaps the doings of the big ones may afford as good a basis as any other for judging the prospective market. Thus, the greatest Dutch rubber planting company has a 4-year contract (including 1929) to supply one of the largest American rubber manufacturers with 250 long tons of crude rubber annually at average London prices, the minimum to be 27 cents with an even split on any excess over a 33-cent average. This may not be comforting to calamity howlers who predict an early famine, but it would seem to imply that the big planting concern fears no shortage and expects no price aviating; as it may also signify its confidence in getting greater acreage yield and, despite dearer labor, lower production costs through higher efficiency.

Rubber Mixing Practice

A Symposium

The following abstracts outline the matter presented in several papers read before the Akron Group, Rubber Division of the American Chemical Society, held at Akron, O., April 26, 1928

Chilled Rolls in the Rubber Industry

N. W. PICKERING

Farrel-Birmingham Co.

PROBABLY no single part of a machine is more vital to the manufacture of rubber products than the chilled iron roll. It is used in most operations from cracking and washing crude rubber to the final accurate calendering where the variation is limited to fractional thousandths. Previous to 1854 the chilled iron rolls used in the copper, brass and paper industry were imported from England. The initiation of the rubber industry decided Franklin Farrel to begin the production of chilled iron rolls and there is a notation in his diary dated 1854 describing the first calender built for Goodyear and expressing the desirability of in future making chilled rolls for the fast developing rubber trade. Thus for nearly seventy-five years Farrel Foundry Machine Co. and the Birmingham Iron Foundry, now combined, have built machinery and chilled iron rolls to meet the requirements of the rubber industry.

Rolls for the rubber industry are divided into four principal classifications: first, crackers and washers; second, refiners; third, mill rolls; fourth, calenders. Each of these classes vary both in chemical analysis and physical qualities. Before treating of the special peculiarities of these rolls it would be well to set forth the method of molding and casting chilled iron.

Chilled roll iron may contain from 3.00 to 3.75 per cent carbon, depending on the physical characteristics desired in the roll. By the proper adjustment of the silicon, sulphur, phosphorus, and manganese content together with the cooling speed the carbon may be retained entirely as combined carbon resulting in white iron, or only partially as combined carbon resulting in either mottled or gray iron. A combination of the above structural characteristics is present in most chilled iron rolls. The body of the roll is formed by a heavy cast iron chiller, and the necks by sand molds. The difference between the heat conductivity of the iron chill and the sand mold results in the barrel of the roll where the molten iron comes in contact with the chiller having a white iron skin of varying depths depending on analysis and purpose, the necks being gray.

Under the microscope the white iron portion of the roll would show a structure composed of cementite and pearlite, the gray part of the roll a structure of pearlite and graphite. From this it will be seen that quick cooling gives a hard surface, for instance, cementite, but where the roll cools more slowly the cementite is changed to free graphite which is comparatively soft. Between the zone which consists of cementite and pearlite and that consisting of graphite and pearlite there is an intermediary zone which has both cementite and graphite. In other words it is composed of what is known as mixed iron. A clear chill is of the same hardness and usefulness until the point of mixed iron is reached. At that point the soft iron or graphite will show up in the form of minute specks on a polished surface.

One of the great difficulties is to control the various elements in the metal and the temperature of pouring to give a chill of the correct depth. Chilled iron is very brittle and the roll strength is principally in the backing iron or in the zone consisting of graphite and pearlite. The chilled surface must be sufficiently deep to resist the crushing or abrasive stresses and yet not so deep as to detract from the strength which is expected to be found in the softer iron which lies below it. This depth of chill varies for different types of rolls.

The roll is cast on end and bottom poured. This is accomplished by runner gates leading to the bottom part of the roll casting, for instance, into the journal or gear fit. The iron is poured from the ladle into pouring boxes on top of the runner gates which lead the iron into the roll at a tangent setting up a swirling motion of the iron as it rises through the body of the roll. This swirling motion tends to throw any slag or foreign particles toward the center leaving the outer surface comparatively free from defects. The pouring is done very rapidly and continued until the iron overflows at the top end of the casting. The iron molds are carefully coated with a lead wash to prevent the molten iron burning onto the mold itself, and all sand parts, for instance, cores and necks, are washed with graphite to prevent any sand slag on the surfaces.

The chilled part of the roll sets up in a very few seconds and the shrinkage in the interior of the roll is fed from a riser at the top of the casting. This question of shrinkage is one of the first difficulties to be overcome. As mentioned above, the skin of the roll sets up almost immediately and this skin is of chilled iron. Chilled iron shrinks about $\frac{1}{4}$ -inch to the foot whereas the softer iron shrinks $\frac{1}{8}$ -inch to the foot. This difference of two to one causes the outer shell to exert a crushing stress on the interior putting the chilled shell itself in tension. If the temperature of pouring varies slightly from that desired or if the chemical composition of the roll is off a very small amount the roll may split from one end to the other when it is removed from the mold. Another danger in the casting is the tearing of the body from the neck this also being due to the difference in the coefficient of expansion of the chilled iron from that of the unchilled iron.

The majority of rubber rolls are gray iron castings in which chaplets used to hold the core in position fuse into the roll metal without effect on its strength. In the case of chilled rolls, however, chaplets do not fuse into the chilled iron consequently the core is supported at the bottom and at the top in such manner that the supporting chaplets are not left in the chilled roll. Every effort is made to keep these roll cores central.

Washer and Cracker Rolls

It is necessary to chill washer and cracker rolls more deeply than any other type. Chilled iron has little strength and if too deep there is danger of the roll breaking. A deep chill cannot be controlled with accuracy. Breakage can be reduced by using the correct cut for the roll service and by

preventing the cut parts from coming into contact when in work.

Refiner Rolls

Refiner rolls are called on for the severest service as they are run together under heavy pressure and much friction and breakage is frequent in this type especially in the larger sizes which account for 85 per cent of the breakage.

Practically all breakage of refiners is in longitudinal splits. If the breaks were due to excessive working stresses they would be circumferential although heat strains also enter as factors. Irrespective of whether the warming up of refiner rolls is external or internal considerable time should be allowed for the operation.

There is no standard practice with regard to crowning refiner rolls, but the greater the crown the more pressure can be applied to the rolls without causing them to open in the middle. However, great pressure bends the metal at each revolution, a condition that chilled iron cannot withstand without breaking through fatigue.

Mixing Mill Rolls

The mill roll is probably worked nearer to its designed strength than any other type. The strains are not as severe as in the refiner roll due to the fact that there is not the variation in temperature and the rolls are not set up with such pressure. However, they are much longer in proportion to their diameter and the 22 by 84-inch mill roll has less factor of safety than any other size. Practically all breakage of mill rolls is circumferential, which clearly indicates that the breakage is due to heavy working stresses added to the condition of hot surface and cool interior. Exceptionally tough or cold stock or improper feeding into the mill may be the direct cause of breakage. Mill rolls are made of strong iron and the chill is kept much lighter than in other rolls.

Cooling Mill Rolls

The cooling of mill rolls is a difficult problem. The present method is by taking off the heat generated in grinding and mixing the rubber batch by passing the heat through the metal toward the center and there cooling the metal with a circulation of cool water. Calculations made from certain tests on an 84-inch mill showed that the total thermal resistance between rubber compound and water on a roll with $4\frac{1}{2}$ inch wall was divided approximately as follows: Thermal resistances rubber to roll, 41 per cent; through roll, 30 per cent; roll to water, 29 per cent.

Calender Rolls

The roll which requires the greatest accuracy is the calender roll. This is subjected to pressures not as great but somewhat similar to those encountered in the case of the refiner roll, and at the same time is subjected to alternate heatings and coolings. Furthermore it must have an even line of contact with its neighbor under the conditions of heating, cooling and the particular pressure for which it is designed. A roll that is cored will be sufficiently strong but if the wall is somewhat thicker on one side than the other or if there is a very slight porosity in the neighborhood of the core the roll will not expand evenly when heated. It may be ground perfectly round when cold but when heated it will become eccentric. Calender rolls are usually cast with a core and then bored out to a diameter about 3 inches larger than the diameter of the core. This gives a true hole through the roll and removes any porous metal from the center of the casting. It is probable that expansion and contraction is largely responsible for the breakage of calender rolls and it has been found that they are subjected to the same stresses in this respect as are refiners.

When a calender is started after a shutdown care should

be taken that it is turning before steam is turned on the rolls as otherwise it is very probable that a break or split will take place along the line somewhat below the level of the drain. After the roll is stopped the steam which has been in it condenses and the lower part of the roll fills with water. If steam is turned on and the roll remains at rest only the top part of the roll expands and breaking stresses are set up at the water line. It is sometimes difficult to establish this maltreatment of the roll as a cause of breakage due to the fact that the crack does not always come directly through the shell at the time the trouble starts. Sudden cooling of a hot roll by water is liable to start a crack in the roll wall especially if it is thick.

The most important factor in the calender roll is accuracy of grinding. Each type of work to which a calender is subjected has its peculiar requirements and a calender that is ground for sheeting out one type of rubber cannot be expected to do good work on friction or skim coating. It is possible to so grind a calender as to give compromise results but perfection is not usually obtained on various types of work with the same machine. Rolls are ground to permit a perfect line of contact between the top and middle and the middle and bottom when running the particular material for which the calender is designed. For average work the middle roll is straight, the top roll crowned, and the bottom roll concaved. The crowning of the top roll compensates for the bending of that roll when a bank of rubber is run between it and the middle roll the result being an even calendaring of the material which passes between these two rolls. The pressure at that point has not only nearly straightened out the top roll but has bent the middle roll downward a few thousandths. The operation between the middle and bottom roll is not quite sufficient to straighten out the middle roll from the pressure on its under side, therefore, a slight concavity on the bottom roll is necessary in order to give an even gage between the bottom and next to bottom rolls.

Calender rolls are ground turning on their own journals, not on centers. Therefore, there is no chance of the face being out of round with the necks. An accurate self-recording caliper measures the curvature of these rolls and this curvature, either crown or concave, is applied by a device on a grinder built for that special purpose. The maximum difference in diameter between the middle and the end of the roll is not the only important factor. In the case of calender rolls the grinding is done with the roll cold and then while it is still turning it is heated with steam and a dial indicator run on the surface to ascertain that it expands evenly. If there is the least unevenness of expansion the roll may be rebored until the results are correct.

Mixing-Mill Roll Speeds, Ratios and Batch Sizes

ERLE C. ZIMMERMAN
Firestone Tire & Rubber Co.

THIS paper relates to practical tests and applies especially to 84-inch mills with 26-inch front rolls and 22-inch back rolls. The cooling system used consisted of a spray pipe and open rolls and a means for cleaning the surface of the interior of the rolls. A great variety of surface speeds and speed ratios are used in current practice. Front roll surface speeds range from 75 to 135 feet per minute and speed ratios vary from even speed of each roll to 1 to 2, front and rear rolls respectively. The effect of mill speeds and ratios on mixing stocks is best determined by study of the temperatures of the stock on the mill, the plasticity of the stock and the uniformity of the resulting mixing.

In the matter of batch size there are certain typical limitations to be observed. For example, when the essential factors are poundage mixed per minute to a given degree of

uniformity a large batch is allowable. In the case of uniform plasticity as the prime factor, a small batch is preferable to a large one. The same is true if the stock is delivered direct from the mixing mill to a tubing machine or calender except when the stock is to be stored and warmed up later. A small batch is indicated for a fast curing stock. If the pigment is added to the mixing in the form of a master batch almost the same number of pounds per minute can be mixed whether the batch is large or small. In general the proper batch size for any stock depends essentially on its nature and the processing to which it is subjected subsequent to mixing.

Breaking of Mill Rolls

J. E. NOONAN

The B. F. Goodrich Co.

AS a matter of practical experience the two most frequent cases of mill roll breakage are the shock caused by feeding the stock into the bite of the rolls, and structural weakness due to uneven thickness of the shell or wall of the roll.

The following instructions to mill men are helpful in avoiding roll breakage.

Set the screws up to bearings and start the stock through the mills close to the guide at bull gear end of the rolls. This is to minimize the shock as the rolls catch the stocks. Cut all stiff stock in small pieces before putting on mill.

When mixing stock which has a stiff non-productive, leave a piece of the batch on the mill to keep the rolls apart and then add the new batch to it by placing the master directly in the soft stock. This eliminates the shock. However, care should be taken not to allow the small piece of batch to remain on the mill too long or the vibration of the mill will first crowd and then release the pressure causing the roll bearings to leave the end of the screw.

Another measure to prevent the breaking of mill rolls is a rule which is very strictly adhered to, and that is any mill man who breaks a perfect roll is either temporarily laid off or discharged. He is usually discharged as it is found that most of the broken rolls are due to nothing but carelessness on the part of the mill operator.

Open Mill Mixing vs. Internal Mixers

P. P. CRISP

Miller Rubber Co.

FIGURES from actual service conditions as given below show that the internal mixer has made it possible to reduce mill room costs very materially. The largest reduction of all is in direct labor and electric power. These only are dealt with in the following comparisons:

For comparative purposes two items only will be considered, taking first an average tread stock, then a friction or coat stock and finally a heel stock. The cost per 100 pounds and machine hour production was as follows:

On an 84-inch mill the direct labor for tread stock was 20 cents per 100 pounds as against 12 cents on the internal mixers. The power was 29 cents as against 18 cents on the mixers, and the machine hour production was 400 pounds against 3,700 pounds with the mixers.

The coat stock on the mill showed a direct labor cost of 25 cents against 14 cents and for power, 38 cents against 23 cents, and machine hour production was 322 pounds against 3,210 pounds.

The heel stock shows a direct labor of 17 cents as against 9 cents, a power charge of 24 cents against 14 cents and a machine hour production of 450 pounds against 4,560 pounds.

In all cases these comparisons include the cost of operating

the batch out mills that is, when speaking of the mixer, the mills are considered as part of the mixing unit.

The greatest trouble encountered in the use of internal mixers has been the elimination of heat generated and the rapid wear in the mixing chamber. The latest development has been the use of sprays in the jackets for cooling which takes away the heat faster, and in the use of inside jacket liners which are more resistful to premature wear and when they are worn out, can be replaced over the week-end at a comparatively small cost.

Boston Group of the Rubber Division

The first meeting of the Boston Group of the Rubber Division of the A. C. S. was held in the Chamber of Commerce Building, Boston, Mass., on May 9. There were 285 rubber chemists, engineers, technologists and guests present. The meeting was under the direction of Chairman C. R. Boggs, who presided at the dinner. At the head table were Chairman Boggs, F. C. Hood, president of the Hood Rubber Co., Everett Morss, president of the Simplex Wire & Cable Co., W. D. McPherson, president of the Cambridge Rubber Co., J. W. Fellows, factory manager of the Boston Woven Hose & Rubber Co., J. M. Bierer, technical superintendent of the Boston Woven Hose & Rubber Co., J. T. Blake of the Simplex Wire & Cable Co., T. K. Sherwood of the Hood Rubber Co., and Prof. Per. K. Frolich of M. I. T.

Following the dinner Mr. Boggs outlined briefly, the purpose of organizing local groups and encouraged all present to join the Rubber Division, not only for the technical advantages to be obtained from the meetings and from the new journal, "Rubber Chemistry and Technology," but also on account of the social advantages. The formal organization was postponed until the next meeting due to the length of the program.

Harry L. Fisher, chairman of the Rubber Division, was unable to be present, but a letter was read expressing his regret and wishing the Boston Group success in its undertaking.

Everett Morss spoke briefly on the advantages of research from a business man's point of view and gave reminiscences of the first employment of a rubber chemist in his factory some twenty-five years ago.

The following four papers given in abstract form below were presented.

Theory of Reinforcing Pigments

J. T. BLAKE,

Simplex Wire & Cable Co.

PIGMENT reinforcement is discussed and a new theory is advanced to account for the reinforcing action of carbon black. A reinforcing pigment is defined as one which forms a bond with the rubber matrix that is stronger than the matrix itself. Non-reinforcing fillers are considered those in which rupture takes place in the bond between the matrix and the particle. Data are given on a molecular tensile curve which substantiates this conception. The action of filler dispersion is discussed and the work of Langmuir and Harkins is applied to rubber. The heats of wetting with dispersing agents are calculated and are found to conform to experimental values. The possibility of extending the reinforcement of rubber by carbon black through the medium of tetrahedral piling is discussed and a prophecy of the physical characteristics of this maximum carbon black rubber mix is advanced.

Softeners and Dispersing Agents

J. M. BIERER,

Boston Woven Hose & Rubber Co.

SOFTENERS are a class of ingredients which have always been used in rubber goods, but which have become of ever increasing importance in rubber compounding. They perform at least four important functions; (1) promotion of the absorption of pigments by rubber during mixing, bringing about a high degree of dispersion; (2) saving of power in the mixing operation with increased economy of manufacture; (3) plasticization of the rubber mix before vulcanization, with consequent speeding up of manufacturing operations; (4) permitting the use of certain active accelerators and in some cases increasing the activity of organic accelerators. Economically, softeners are essentially dispersing agents. The valuable effect of stearic acid in addition to the resins present in plantation rubber is shown by a comparison of a tire tread compound mixed with resin free rubber, raw rubber, and raw rubber with the addition of increasing amounts of stearic acid up to 5 per cent. Further additions of softener produce a debilitating effect which more than counterbalances the benefit derived from increased dispersion. The above example shows the important part which softeners play in modern compounding.

Heat Transfer in Vulcanization

T. K. SHERWOOD,

Hood Rubber Co.

THE vulcanization of rubber goods and the problem of obtaining the optimum cure is primarily one of heat transfer. Temperature lag in the heating of rubber articles is found to be responsible for the marked non-uniformity of cure of most products. "Unsteady state" heat flow is considered, the work of Gurney and Lurie is discussed, and a method proposed for analyzing data on temperatures in rubber goods during cure. After experimentally determining the temperature during the curing process and knowing the relation between the rate of cure and the temperature, a procedure is outlined for the calculation of the resulting curing effect at different points in a solid rubber object. The economic waste due to defective cure in the case of tires is shown and a new water cure process for tires is described. The new procedure is found to effectively reduce the non-uniformity of cure caused by temperature lag effect and also to reduce considerably, the necessary curing time.

The Structure of Rubber

PER K. FROLICH

A NEW theory of the structure of rubber is presented and various familiar plant problems are discussed in the light of this theory. The following four characteristics of rubber are considered: (1) the amorphous character of rubber; (2) the chain structure of the rubber molecule; (3) the tendency of working and heating to break down the large molecules into smaller units with an attendant decrease in viscosity; and (4) the ability of rubber to combine with sulphur through the medium of double bonds. The above characteristics are used to explain the effect of breaking down in general, of hot versus cold milling, of the increase in viscosity due to the addition of sulphur and the counteraction of depolymerization due to the simultaneous heating. The role of accelerators, the quality of reclaimed rubber versus that of raw rubber and the function of fillers are discussed. The X-ray diffraction pattern developed under strain is easily explained on the basis of this new theory on the structure of rubber.

Tire Simplification Program

Eighteen Sizes with New Method of Marking Receive General Approval

Car and tire manufacturers have agreed upon a program of 18 balloon tire sizes for passenger cars as a standard list for 1929 equipment. Originally there were two programs proposed, one by the Rubber Association of America and one by the Society of Automotive Engineers. Each contained 16 sizes of which 14 were identical but each list had two sizes not in the other list.

At a meeting held in Detroit, March 26, there were in attendance 36 representatives of tire, rim and car manufacturers, the National Automobile Chamber of Commerce, the Rubber Association of America, the Society of Automotive Engineers and the Tire & Rim Association. This meeting approved a new table of 17 sizes which included all of the original S. A. E. list and one of the two extra sizes found in the R. A. A. list.

It was further voted that tires hereafter be marked with the cross-section followed by the rim diameter on which the tire is to be used, and beneath in smaller numbers the former name size of the tire. For example, a tire will be marked 6.00-19 and beneath in half size numerals 31 by 6.00. The new marking includes the two main factors—cross-section and rim diameter. The reference to the size replaced will identify tires with the new marking in terms of the old.

The compromise program was submitted to the members of the National Automobile Chamber of Commerce and approved by all but three car manufacturers who asked that the one size omitted from the R. A. A. list, the 5.50-inch cross-section on the 18-inch rim, be included. At a meeting of the directors of the Chamber at Detroit, May 3, it was decided to add this, making the program which now has universal acceptance a standard list of 18 sizes. There was also general approval of the new method of marking, considering that the replacement information is a temporary expedient to be retained only until the new marking becomes generally understood.

TIRE CROSS SECTION

Rim Diam.	4.50	4.75	5.00	5.25	5.50	6.00	6.50	7.00
18	5.25-18	5.50-18	6.00-18	6.50-18	7.00-18
	28x5.25	28x5.50	30x6.00	30x6.20	30x6.75
19	30x6.50	32x7.00
	4.75-19	5.00-19	5.25-19	5.50-19	6.00-19	6.50-19	.....
	28x4.75	28x4.95	29x5.25	29x5.50	31x6.00	31x6.20	.....
20	29x5.00	.....	.....	.....	31x6.50	.....
	4.75-20	5.00-20	.....	5.50-20	6.00-20	6.50-20	7.00-20
	29x4.75	29x4.95	.....	30x5.50	30x5.77	32x6.20	32x6.75
21	30x5.00	.....	.....	32x6.00	32x6.50	34x7.00
	4.50-21	.....	.....	.....	.....	.....	.....	.....
	30x4.50	.....	.....	.....	.....	.....	.....	.....

There will, of course, not be immediate benefit from the adoption of the standard list as tire manufacturers will have to make other sizes for some time to come to take care of replacements, but with all new production for 1929 and thereafter specifying sizes within this list there will finally be only those sizes for passenger cars that will have to be manufactured and which tire dealers will have to stock.

There is also the expectation that from time to time representatives of the car and tire manufacturers will confer on revision of the standard list, particularly with a view to dropping the least used sizes, thereby gradually reducing the number, and there is high probability that eventually as few as ten may prove sufficient.

Japanned Rubber Molds

The surfaces of rubber molds may be improved with a coating of baked japan in which is incorporated a lubricating material such as aluminum stearate. A. P. Tallman, U. S. Patent No. 1,652,218.

Pulley Band Tire Building Process

A review of the patent literature relating to building pneumatic tires by the pulley band or flat band process

JOSEPH ROSSMAN

THE following patents relating to the flat band process of building tires, continued from INDIA RUBBER WORLD, May 1, 1928, have been briefed and are given in chronological order.

35. DeMattia, 1,456,425. May 22, 1923. A pulley band is shaped by inflating a tube supported on a collapsible core.

36. Sloper, 1,458,732. June 12, 1923. Making an endless flat tire band comprising contracting one of the layers by suction, adhesively securing the second layer, contracting both layers, and so on until the desired number of layers has been united.

37. Steinle, 1,470,889. Oct. 16, 1923. A pulley band is built on a collapsible drum and then formed into tire shape by presser members engaging the beads one of which is shiftable on the drum.

38. Hopkinson, 1,474,149. Nov. 13, 1923. A pulley band is shaped between two relatively moving platens which shift the beads towards each other. Compressed fluid is simultaneously admitted to the interior of the band. The shaped tire is retained and sealed by locking rings so as to retain the compressed fluid.

39. Gammeter, 1,480,719. Jan. 15, 1924. The tire band is shaped by applying vacuum to the outer surface of the band and moving the beads towards each other.

40. Destribats, 1,485,170. Feb. 26, 1924. A laminated pulley band is shaped on an inflatable core, beads are then applied and the fabric shaped about them.

41. Sloper, 1,487,033. Mar. 18, 1924. An apparatus by which a pulley band is shaped between two relatively movable plates and internally supplied fluid pressure. The tire is retained in shape by an automatically expansible retaining ring. The process is claimed in patent 1,372,567. Mar. 22, 1921.

42. Sloper, 1,487,034. Mar. 18, 1924. A vacuum chamber for shaping pulley bands. The upper part has a movable plate and the lower part is connected by a flexible member to a movable platen.

43. Abbott, 1,507,563. Sept. 9, 1924. The method of shaping a pulley band by partially shaping the band with fluid pressure in direct contact with its interior and vacuum applied to its outer surface.

44. Abbott, 1,524,467. Jan. 27, 1925. A tire building drum having adjustable separating members or rings at its ends.

45. Logan, 1,525,455. Feb. 10, 1925. A drum is disclosed carrying an inflatable tube in its central portion to stretch the central portion of the tire material and a bag at each side adapted to act on the side portions of the material.

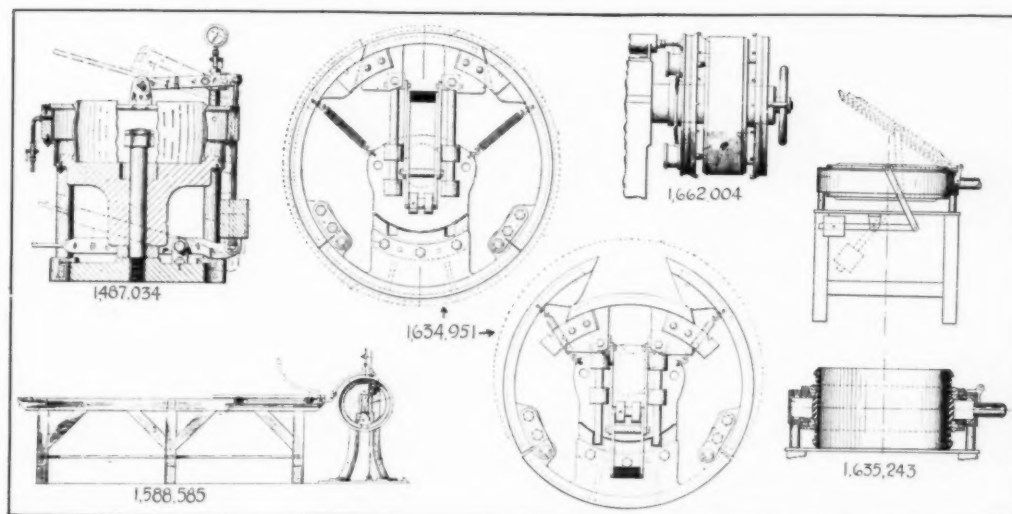
46. De Mattia, 1,528,659. Mar. 3, 1925. A pulley band is hermetically sealed at its edges and then expanded between vulcanizing and shaping molds.

47. Little, 1,529,838. Mar. 17, 1925. A device for stretching endless bands having four relatively movable stretching rollers.

48. Marquette, 1,529,841. Mar. 17, 1925. An endless band is applied on an inflatable core and shaped, the core is contracted and the operation repeated with the next band and so on until the desired number of layers is built up.

49. Neal, 1,536,723. May 5, 1925. A pulley band is stretched on a series of four rollers, the band is released and while in stretched condition placed upon a tire building form.

50. Marquette, 1,551,040. Aug. 25, 1925. A method of building a tire casing which comprises forming an endless band of tire material, placing beads at the edges, expanding the central portion by means of an airbag, and then folding the marginal portions about the beads.



51. Midgley, 1,556,295. Oct. 6, 1925. A drum having an annular groove for receiving an inflatable tube and a pair of rings slidable on the drum having a flexible band attached to them to limit the expansion of the pulley band.
52. Gautier, 1,562,758. Nov. 24, 1925. A machine for making endless bands of fabric with circumferential transverse lines so as to assist in positioning the bands on the building drum.
53. Otto, 1,563,519. Dec. 1, 1925. A machine for shaping endless bands by fluid under pressure and mounting the band upon a bull ring with which it can be removed bodily for vulcanizing purposes.
54. Tew, 1,577,664. Mar. 23, 1926. A tire building drum made of a set of flexible plates which remain flat during the tire building operation and are then flexed to shape the tire band built thereon.
55. Kearns, 1,581,743. April 20, 1926. Wide plies of fabric are used so that in folding the edges over the beads on a drum, the plies will overlap. A gum strip is applied between the overlapping edges.
56. Kearns, 1,588,585. June 15, 1926. A tire building apparatus comprising a drum carrying an inflatable tube for shaping the tire, a fabric feed table adjacent the drum and stitching device pivoted to the end of the table capable of swinging over the drum.
57. Gammeter, 1,609,620. Dec. 7, 1926. A pair of annular bead rings are spaced apart by means of sharp pointed spacing members, fabric is then wound about the beads and upon completing the structure the spacing members are withdrawn.
58. Lough, 1,611,355. Dec. 21, 1926. A tire building drum having adjacent pivoted arms carrying strip guiding devices swingable over the drum.
59. Abbott, 1,618,794. Feb. 22, 1927. A pulley band is initially bulged by the platens of a press and finally shaped by vacuum acting on the outer surface of the band.
60. Hopkinson, 1,625,122. April 15, 1927. A pulley band is partially shaped to tire form, a tread is applied to hold the band in shape. The shaping is then completed and the tire vulcanized.
61. Midgley, 1,633,342. June 21, 1927. A pulley band is built by laying a series of cords to and fro over a drum with bead rings interposed between the layers.
62. Mason, 1,634,951. July 5, 1927. A collapsible flat building drum made up of a number of hinged segments and a movable key section. As the key section is withdrawn by toggle levers the pivoted sections are swung inwardly by means of springs.
63. Abbott, 1,635,240. July 12, 1927. An annular vacuum chamber U shaped in cross section for shaping flat tire bands has flexible members attached on the top and bottom walls which engage the beads of the pulley band and thus seal it insuring a good vacuum.
64. Abbott, 1,635,241. July 12, 1927. An annular vacuum shaping apparatus having slidable flexible rings on its top and bottom walls to engage a pulley band and seal the vacuum chamber.
65. Abbott, 1,635,242. July 12, 1927. An apparatus similar to the one in patent 1,635,241 except that the sealing members are rigid.
66. Abbott, 1,635,243. July 12, 1927. An apparatus similar to the one in patent 1,635,241 except that the flexible sealing members are actuated by an auxiliary vacuum chamber at the rear of the flexible sealing rings.
67. Johnson, 1,636,056. July 19, 1927. A collapsible flat building drum made up of collapsible segments which are actuated by links.
68. Kuhn, 1,637,195. July 26, 1927. A collapsible building drum having an axially movable ring at each edge. The width of the drum is adjustable.
69. Johnson, 1,648,132. Nov. 8, 1927. A collapsible building drum made up of a plurality of segments all hinged together and a single means to collapse them.
70. Steinle, 1,654,351. Dec. 27, 1927. A pulley band is built of greater girth centrally than marginally and then shaped into tire form.
71. Feyzes, 1,655,897. Jan. 10, 1928. A collapsible building drum having outwardly beveled edges and bead supporting rings adapted to be positioned on the beveled edges.
72. Jenkinson, 1,659,321. Feb. 14, 1928. A pulley band is built with a bead having a loose cover so that when it is shaped into tire form the bead core will not be put under any torsional stress since it is free to slip.
73. Neal, 1,659,634. Feb. 21, 1928. A tire band stretcher having a set of relatively movable pulleys which are power driven.
74. Neal, 1,659,635. Feb. 21, 1928. A machine for stretching endless bands having two spaced rollers which are separable to a predetermined distance.
75. Jenkinson, 1,662,004. Mar. 6, 1928. A tire machine comprising a rotatable cylindrical drum having outwardly beveled edges and cooperating bead setting rings movable simultaneously toward the drum.
76. Shively, 1,662,016. Mar. 6, 1928. A tire building drum having a stitcher mechanism adjacent the drum.
77. Midgley, 1,664,259. Mar. 27, 1928. A pair of heads are supported in spaced relation on two rollers. Tire material is supplied to the beads tangentially and the edges of the tire material are folded around the beads producing an endless flat band.
78. Stevens, 1,665,194. April 3, 1928. A band building machine having two rollers which press the fabric together and a table in front of and directed toward the nip of the rollers.
79. Wetmore, 1,665,870. April 10, 1928. A band shaping device consisting of a series of tire shaping segments engaging the interior of the tire band carried by links which act in unison to shape the band.
80. Mather, 1,667,263. April 24, 1928. A pulley adapted to support a tire band having means to seal the edges of the band when it is shaped by introducing air directly between the pulley and the band.

British Patents

81. Morland, 20,951 of 1899. This patent discloses a collapsible building drum having grooves to receive beads. Fabric is placed on the drum on which the beads are then positioned and the edges of the fabric turned over the beads.
82. New Eccles Rubber Works, 18,587 of 1906. A pair of spaced bead rings are guided and supported by driven rollers and fabric is wrapped about the beads as they are rotated and pressed against the beads. The rubber tread is then applied to the built up carcass by a machine described in British patent 2,728 of 1907.
83. Hubbard, 1,207 of 1907. A pulley band is built up on a drum having a recessed face for receiving the tire material. Rotating brushes fold the edges of the fabric around the beads.
84. Price, 25,181 of 1912. A collapsible building drum for making a flat tire band. An arm is pivoted over the drum for pressing the tire material on the drum. A support is also provided at the side of the drum for carrying various trimming and finishing tools.
85. Walton, 214,704. April 22, 1924. A pulley band is shaped by means of a liquid or pellets applied to its inner surface and rotating so as to shape the band by the centrifugal force.
86. Gautier, 216,230. May 27, 1924. A complete tire band is built on a drum equipped with fabric guides and stitching tools movable over the drum.

87. Dunlop Rubber Co., 229,423. Feb. 26, 1925. A flat tire building drum is provided with an overhead turret carrying various working tools.

88. Backdahl, 232,595. Nov. 12, 1925. A machine for shaping tire bands by centrifugal action.

89. Swern, 270,162. May 5, 1927. Apparatus for shaping tire bands by circular segments actuated by levers fastened to a piston bead.

Other Foreign Patents

90. Nivet. (French), 389,181. June 20, 1908. A tire band is built on a collapsible flat building drum having grooves for receiving beads.

91. Shively, (Australia) 7,120. Aug. 25, 1927. A collapsible building drum having outwardly beveled edges.

92. Templeton, (Australia) 7,034. April 27, 1927. A building drum having a device movable toward the edges for trimming the selvage portions of a tire.

93. Ahls, (German) 386,106. Dec. 4, 1923. A tire building drum having grooves for receiving the tread and the beads.

Simplified Practice Is Popular

Rubber manufacturers have been advised that the United States Bureau of Standards has added to its master specifications four approved by the American Marine Standards Committee of the Division of Simplified Practice, and covering $\frac{3}{4}$ -inch and 2-inch flexible metallic hose, $2\frac{1}{2}$ -inch unlined linen fire hose, and $2\frac{1}{2}$ -inch single and $2\frac{1}{2}$ -inch double jacketed cotton rubber-lined fire hose for use on ships and wharves.

The Bureau reports that in its endeavors to reduce avoidable waste in industry it completed during 1927 eighteen new simplified practice recommendations, bringing the total projects up to 80; that associational indorsers grew from 686 to 898; and that individual acceptors had increased from 2,775 to 6,676, showing that more buyers are specifying simplified lines. A survey of fifteen recommendations showed that acceptors representing an average of 82.61 per cent of the total volume of the industry affected had been following the simplified practice, a marked increase over 1926.

It was also found that through inventory reductions, quicker turnover, improved delivery, and better service, conformance to the newer, less complex standards brought about definite money savings, small manufacturers in many cases faring even better proportionately than larger producers; and that through economies effected the public was benefited in no small degree through price reductions on a wide range of goods.

What Sulphur Form is Best?

Dr. Douglas F. Twiss points out that while finely dispersed forms of milk of sulphur, or precipitated sulphur and various colloidal sulphurs, can be used to especial advantage with many of the newer "latex processes," where small particle size is needed to form more stable suspensions, none of these forms has any advantage in all the ordinary processes of vulcanizing rubber over staple, well-ground crystalline sulphur. For satisfactory dry mixing he recommends an average particle size of 0.02 millimeter, for example, 0.004-0.030. "We know of no agent," says Dr. Twiss, "superior to sulphur or even a satisfactory substitute for sulphur in vulcanization. If, however, it be assumed that the reinforcing effect of carbon black is of the same character as vulcanization, this statement must be qualified by saying 'for certain ranges of vulcanization.'"

The Process Development Department

C. E. MAYNARD

Manager Process Development Department
The Fisk Rubber Co.

Changes in processes are essential to meet the highly competitive conditions of industry and the lowering of prices without the elimination of profit. Modern industry is inevitably abandoning the former slow and uncertain development of new processes and machines and coordinating the inventors' functions into team-work organizations known as process development departments.

A comprehensive account of the functioning of such a department in a large tire manufacturing plant appeared in *The Fisk Candle* and is abstracted in the following paragraphs.

The process development department is continually studying the possibilities of altering processes and correcting faults in present methods where varying uniformity in workmanship may cause trouble or where too much depends upon the worker in obtaining a uniform product. Responsibility for the processes naturally implies responsibility for the development of the machinery by which these processes are performed.

The process development department works as follows to accomplish these purposes. First, those places are discovered where apparent improvement can be made in method. Sometimes these possibilities are pointed out by other departments or by the employees on the job.

From detailed time studies and actual observations of the process, a line of attack is planned and how many operations can be eliminated. With these facts as a basis, a sound conclusion can be made whether the project is justified. If the facts and figures indicate favorably, and if it happens to be a machine or mechanical, it is then drawn up, made in the machine shop of the department and then tried out. Time studies are made of the job and if the final time studies show that the savings originally hoped for will materialize, the drawings are released to the engineering department in case more machines are needed.

The process development department also has other duties. It is incumbent upon it to investigate all new rubber methods which are used or developed by other companies. Some of these studies involve considerable work such as the gathering of figures and data and comparing them. The department must also keep in mind a general course of development which will prevent building machinery which is likely to be soon scrapped due to another development superseding it.

Process development department is continually working upon fundamental problems or research. These are the type of problems from which no immediate return can be expected but they offer tremendous possibilities to the concern that is fortunate enough to work them out. The department should have the whole-hearted support of every employee because it works to reduce the cost of manufacturing the product which is necessary if the company is to prosper.

In short, one might say that the process development department strives for the improvement of working conditions, the betterment of the product, and the reduction of manufacturing costs that the company can maintain or improve its position in the industry.

EXPORTS OF COTTON CLOTH FROM THE UNITED STATES during the first quarter of 1928 included 1,587,809 square yards of tire fabrics, value \$645,340 and 3,489,130 square yards of duck, value, \$1,202,066.

Dealers' Stocks of Automobile Tires

Slight Increase in Average Number of Casings Per Dealer Over Preliminary Report—Efforts to Concentrate on One Make Tire Continue

FINAL statistics compiled by the Rubber Division, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C., contained in Special Circular No. 1945, show stocks of automobile casings, inner tubes, and solid and cushion tires held by dealers reporting on April 1, 1928, as compared to April 1, 1927. The final average number of casings per dealer, 81.2, is an increase of 2.3 over the average in the report issued on April 16, 1928.

The average stock of automobile tires held by the average tire dealer in the United States was 81.2, and the average number of inner tubes was 123.4. In the table the states have been reported in the geographic divisions recognized by the Bureau of the Census in its census returns. The group "Unallocated" includes questionnaires for which the proper state allocation was not known and returns received too late to be included under the state named.

A comparison with last year's survey shows that a smaller percentage of reports fell into the classes having less than 25 casings, though the class of dealers having less than 10 casings was heavier, and more reports fell into each class of dealers having more than 25 casings.

Stocks of solid or cushion tires per dealer was higher, an average of 27.0 tires per dealer leading the 1927 figure which was 24.7 per dealer.

Analysis of the report shows more dealers concentrating sales efforts on one make than in preceding surveys.

In the statistics prepared by The Tire & Rim Association of America, Inc., during the period 1921-1927, inclusive, the figures were 40.8 per cent balloon sizes and 59.2 per

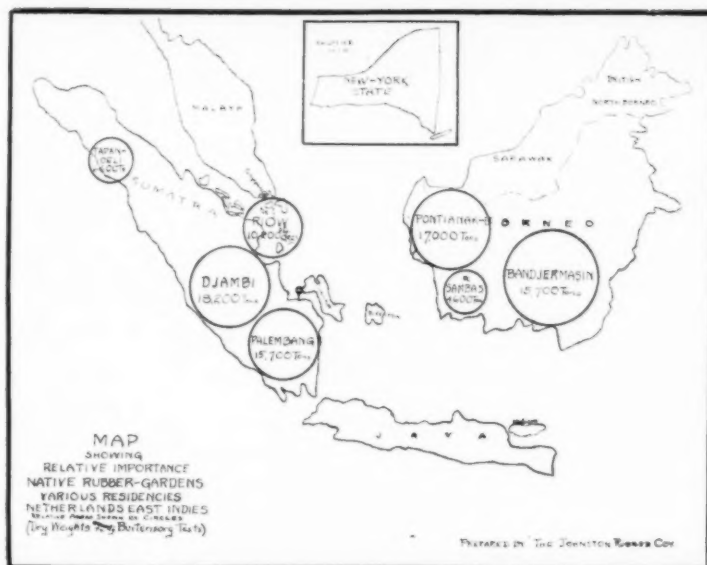
Stocks of Tires

	April 1, 1927			April 1, 1928		
	Number	Dealers Reporting	Average Per Dealer	Number	Dealers Reporting	Average Per Dealer
Total casings (including balloons).....	2,604,432	36,865	70.6	2,514,112	30,974	81.2
Balloon casings (alone).....	868,312	24,431	35.5	1,008,223	22,039	45.7
Inner tubes.....	4,370,989	36,146	120.9	3,816,169	30,933	123.4
Solid and cushion tires.....	44,868	1,817	24.7	37,873	1,403	27.0

STOCKS OF TIRES BY STATES, APRIL 1, 1928.

	TOTAL CASINGS			BALLOON TIRES		INNER TUBES		
	No. of Dealers Reporting	No. of Tires on Hand	Average No. Per Dealer	No. of Dealers Reporting	No. of Tires on Hand	No. of Dealers Reporting	No. of Tubes on Hand	Average No. Per Dealer
New England								
Maine.....	464	28,905	62.3	225	12,092	464	40,328	86.9
New Hamp.....	217	13,836	63.8	182	6,947	217	21,955	101.2
Vermont.....	184	10,723	58.3	157	5,021	184	19,321	105.0
Mass.....	861	83,313	96.8	673	37,580	861	133,869	155.5
R. I.....	130	8,899	68.5	89	4,411	130	12,583	96.8
Conn.....	324	24,204	74.7	203	11,039	324	38,200	117.9
Middle Atlantic	2,180	169,880	77.9	1,529	77,090	2,180	266,256	122.1
N. Y.....	1,915	171,779	89.7	1,427	93,781	1,915	258,448	134.9
N. J.....	594	31,154	86.1	445	32,166	595	85,253	143.3
Penna.....	2,701	177,176	65.6	1,934	85,756	2,701	286,436	106.0
East North Central	5,210	400,109	76.8	3,806	211,703	5,211	630,137	120.9
Ohio.....	1,811	141,892	78.4	1,352	60,806	1,811	122,368	67.6
Ind.....	1,057	84,804	80.2	765	32,129	1,057	130,457	123.4
Ill.....	1,532	139,409	91.0	1,046	54,751	1,534	211,748	138.0
Mich.....	852	85,110	99.9	760	33,127	1,057	135,984	128.6
Wisconsin.....	1,034	97,552	94.3	770	34,084	1,034	151,890	146.9
West North Central	6,286	548,767	87.3	4,693	214,897	6,493	752,447	115.9
Minnesota.....	900	76,270	84.7	751	29,859	900	128,090	142.3
Iowa.....	883	79,449	89.9	765	16,931	1,072	130,090	121.4
Missouri.....	1,064	105,861	99.5	731	44,121	1,018	153,657	150.9
N. Dak.....	433	25,743	59.5	319	9,373	433	46,094	106.5
S. Dak.....	372	20,642	55.5	288	7,130	372	39,553	106.3
Nebraska.....	536	35,847	66.9	396	14,243	536	59,103	110.3
Kansas.....	1,028	66,507	64.7	595	26,070	839	100,106	119.3
South Atlantic	5,216	410,319	78.7	3,845	147,727	5,170	656,693	127.0
Delaware.....	56	5,126	91.5	33	2,316	56	9,698	173.2
Maryland.....	382	35,705	93.5	245	11,163	382	56,483	147.9
D. C.....	46	2,629	57.2	34	1,125	46	5,444	118.3
Virginia.....	807	53,503	66.3	458	14,400	807	70,492	87.4
W. Va.....	467	29,973	64.2	298	12,086	467	45,811	98.1
N. Car.....	540	41,664	77.2	361	16,714	540	69,557	128.8
S. Car.....	275	13,180	47.9	181	4,225	275	28,072	102.0
Georgia.....	414	30,503	73.7	271	12,843	414	63,475	153.5
Florida.....	300	39,343	131.1	208	19,379	300	58,678	195.6
East South Central	3,287	251,626	76.6	2,089	94,251	3,287	407,710	124.0
Kentucky.....	401	32,773	81.7	237	13,297	401	59,971	149.6
Tenn.....	339	33,853	99.9	249	14,165	339	60,343	178.0
Alabama.....	352	31,060	88.2	221	8,640	352	54,185	153.9
Mississippi.....	296	21,349	72.1	191	8,818	296	37,955	128.2
West South Central	1,388	119,035	85.8	898	44,920	1,388	212,454	153.1
Arkansas.....	350	36,311	103.7	218	7,740	350	40,568	115.9
Louisiana.....	300	20,179	67.3	196	7,683	300	44,455	148.2
Oklahoma.....	567	66,744	117.7	401	20,041	567	101,481	178.9
Texas.....	1,327	110,938	83.6	959	47,782	1,327	196,025	147.7
Mountain	2,544	234,172	92.0	1,774	83,246	2,544	382,259	150.4
Montana.....	310	23,897	77.1	227	11,751	356	43,925	123.4
Idaho.....	229	13,290	58.0	156	6,610	229	21,153	92.4
Wyoming.....	122	6,869	56.3	104	3,592	122	11,058	90.6
Colorado.....	410	22,798	55.6	291	10,763	410	36,473	89.9
N. Mexico.....	163	8,219	50.4	119	4,176	163	13,109	80.4
Arizona.....	165	16,021	97.1	108	4,444	165	19,523	118.3
Utah.....	219	16,074	73.4	128	7,222	219	22,014	100.5
Nevada.....	58	3,799	65.5	45	1,342	58	5,434	93.7
Pacific	1,676	110,967	66.2	1,178	49,900	1,722	172,689	100.3
Washington.....	728	49,851	68.5	475	12,667	728	73,109	100.4
Oregon.....	439	28,685	65.3	356	11,485	439	43,871	99.9
California.....	1,750	164,464	94.0	1,200	56,202	1,501	136,278	90.8
Unallocated	2,917	243,000	83.3	2,031	80,354	2,668	253,258	94.9
Total United States	30,974	2,514,112	81.2	22,039	1,008,223	30,933	3,816,169	123.4

cent high pressure sizes. The percentage of balloon tires to total stocks on April 1, 1927, and April 1, 1928, correspond reasonably close with the rim production figures for the preceding seven years. Dealers who sell automobiles are largely in the class stocking 26 to 300 casings; those who sell gasoline chiefly stock less than 200 casings; and a high percentage of dealers stocking over 200 casings have facilities for repairing inner tubes and vulcanizing tires.



BANDJERMASIN. Area S. and E. Borneo 150,000 sq. mi. Rice, rubber, rattans, 15,000,000 rubber trees.

DJAMBI. Area 17,000 sq. mi. Pop. 160,000. Rattans, gums, and rubber almost exclusively. Over 20,000,000 rubber trees.

PALEMBANG. Area 30,000 sq. mi. Pop. 800,000. Pepper, coffee, rattans, gums, rice, and 15,000,000 rubber trees.

PONTIANAK AND SAMBAS. Area W. Borneo 55,000 sq. mi. Sparsely settled. Rice, sago, rattans, copra, pepper, gambier, cutch, and 15,000,000 rubber trees.

RIOW. Comprising archipelago and part of Sumatra mainland. Rice, sago, rubber, 5,000,000 trees.

TAPANOELI. Area 15,000 sq. mi. Pop. over 1,000,000. Rice, coffee, some pepper and 3,000,000 rubber trees.

Native Rubber Situation In The Netherlands East Indies

CLIFFORD C. JOHNSTON

FACTORS that will determine the production of rubber in the native gardens of the Dutch possessions in the Far East are numerous and vary considerably in the six or seven important residencies distinguished for native rubber activities. The salient factors are: (1) relative dependence upon hired labor, (2) average daily production per tapper, and (3) feasibility of natives turning to the cultivation of crops other than rubber. The residencies noted for native rubber gardens are, in the order of their importance: Djambi, Bandjermasin, including two other important districts of South and East Borneo; Pontianak and Sambas, included in West Borneo; Palembang, Riow, and dependencies, and Tapanoeli. The relative sizes of these territories are indicated on the accompanying map as well as their 1927 exports in dry weights. The rubber industry owes much to the Dutch East Indies statistics regularly compiled by the U. S. Department of Commerce and issued by the Netherlands Division of Commerce and Agriculture in Buitenzorg, Java. It was through the instrumentalities of the latter that there functioned in 1924 and 1925 the Native Rubber Investigation Committee, the results of whose field investigations have been incorporated in this thesis.

The "dirt-farmer" of the Far East is primarily interested in the cultivation of rice and rubber, other crops being of secondary importance. There are, however, exceptions to this rule, notably in Djambi where rubber in recent years has supplanted rice as the staple crop. If the native farmer lives in the lowlands of Bandjermasin he cultivates "sawahs," or wet cultivation in the swampy lands. If he lives in the highlands of Tapanoeli he or his family cultivate paddy on the hillsides. But rice cultivation alone would never permit him to save up enough for a pilgrimage to Mecca or permit the purchase of such luxuries as shoes,

tinned sweets, cigars or beverages. The cultivated desires of the newer generation for something in addition to rice, Indian corn, sago, tapioca and fruits have encouraged the native rice farmer to work after hours and outside of the rice season in the clearing of lands for the cultivation of rubber. The usual course pursued has been for a farmer to clear about an acre of ground from which rice will be harvested for one or two years. At the end of that time previously planted rubber seedlings have attained a growth sufficient to combat the growth of jungle grasses. For the next three or four years no further attention is paid to the trees, and at the end of that time they are tapped, even though their circumferences are less than that of three or four-year-old trees on estates.

In the interim the native grower has gradually added to his holdings, as it is comparatively easy to secure permission from the government to clear and use additional land, taxation on which is only nominal. By the time all of his rubber trees are ready for tapping he is compelled to hire tappers, who are usually paid one-half of the crop harvested as their wages. The extent of the dependence upon hired tappers varies in the different residencies. The following table will serve to indicate relatively this dependence:

	Percentage of Trees Tapped by Hired Labor
Palembang	10
Tapanoeli	30
Bandjermasin	60
Djambi	75
Riow	75
Pontianak and Sambas	Over 75

In Pontianak and Sambas the Chinese proprietors of the native rubber gardens will be able to secure such labor as they may desire in all probabilities. In Riow an exodus of tappers from the native gardens is likely to occur with prices for rubber not permitting a continuance of the high

wages paid heretofore. Proximity to the Malayan estates that have been restricting and may now desire to increase their labor forces so as to permit increased tapping, will not prove a blessing to the native owner in Riow who is dependent upon hired tappers. In Djambi living costs are high due to the necessity of importing practically all food and clothing supplies by very poor means of communication with the interior. In previous times of low prices Djambi owners have in some instances had to pay their tappers as high as three-quarters of their daily harvests as wages. Bandjermasin tappers in August, 1922, when London prices were about 7 pence a pound, continued to tap full force.

The daily yields per tapper are highest in the three residencies which have the highest standard of wages, Djambi, Riow and Pontianak, the minimum wage there being above the 20 cents (U. S. currency) a day customary in most of the remaining districts. This wage is equivalent to two-thirds of an ordinary labor day. The varying yields are indicated in the following table based on the surveys of the Native Rubber Investigation Committee:

	Average Daily Yields Per Tapper, Dry Weights Pounds
Djambi	5.0 and over
Pontianak, and Sambas	3.5
Riow	3.5
Tapanoeli	2.5
Palembang	2.5
Bandjermasin	2.5 or less

The high yields of Djambi tappers are largely due to the fact that there is such an abundance of trees that tappers can choose fields which have not been so severely overtapped as others. In Riow and in Pontianak more experienced and skillful tappers are employed than elsewhere in the various residencies.

Besides rubber, the native farmers of the Dutch East Indies cultivate for export, cocoanuts, coffee, pepper, sago, cacao, cotton, kapok, spices, citronella and patchouli grasses, tobacco, castor beans, linseed and sesame seed, peanuts, etc., besides engaging commercially in fishing and the export of forest and swamp land products such as rattans, gums, jelutong, and cutch. Cattle growing also is engaged in but is limited by the small amount of grazing ground. The relative opportunities for finding employment in activities other than rubber growing are about as follows:

Pontianak, and Sambas ..	Excellent	Rice, sago, rattans, pepper, copra, gambier and cutch.
Palembang	Good	Pepper, coffee, gums, rice.
Bandjermasin	Good	Rice, rattans.
Tapanoeli	Fair	Rice, coffee, pepper.
Riow	Fair	Rice, sago, rattans.
Djambi	Poor	Some rattans and gums.

If rubber does not pay, the resourceful native with a family dependent upon him can discharge his hired tappers and depend upon the labor of himself and family, or engage in some other occupation. If the care-free native tapper decides that his wages are not satisfactory he is apt to return to his native village and spend the most of his time squatted on his haunches outside the village "keddy" that corresponds to the village store in this country. If not in possession of a small paddy field or fruit grove he will work for some one else but only so long as is necessary to provide a mere subsistence.

The actual shipments of native rubber have varied con-

siderably since 1922 (See Table). Prior to 1925 the official customs figures were less accurate than those of subsequent years when more care has been given to export declarations by government officials. The usual method of arriving at a figure presumed to represent the total weight of dry rubber has been to assume an average shrinkage of 30 per cent or $33\frac{1}{3}$ per cent. In the tabulation of 1927 exports use has been made of the Buitenzorg shrinkage tests of samples from the various residencies, the shrinkage rates of which are tabulated.

A curtailment of 25 per cent of the 1927 exports would amount annually to about 25,000 tons dry weight. Increased production to 100 per cent by British estates in Dutch territory of an area of 300,000 acres, that have heretofore voluntarily restricted crops, would offset this curtailment of native rubber as soon as the additional skilled tappers were available. However, as soon as the native tappers have been accustomed to lower prices for rubber and the consequential lowering of their standards of living, it should be quite possible for the native gardens to compete with the estates. Estate tappers bring in from two to three times as much latex daily as do the tappers in the native gardens, but the owner of a native garden free of debt has only tapping costs to consider. If, as is the case on well-managed estates, tapping costs amount to 3 cents a pound, other expenses amount to 6 cents a pound and over, the native gardens can afford to pay 9 cents a pound for "all-in-all" costs. With London prices at 7 pence, the average native garden can produce rubber at a profit, whereas the average estate will show a deficit.

In a recent publication issued by the Division of Commerce in Buitenzorg, Java, A. Luytjes, forest engineer for the Native Rubber Investigation Committee, states that since 1916 rubber planting has developed into a regular native cultivation, from 1,200,000 to 1,500,000 acres have been planted in the Dutch East Indies. The Rubber Growers' Association of London estimated in April, 1928, that the area was only about 500,000 acres, which

Shipments in Long Tons

(From Official Statistics)

	1922	1923	1924	1925	1926	1927	Shrinkage Rate Per Cent	1927 Dry Wts.
Djambi	9,500	17,100	22,300	28,900	29,900	36,500	50	18,200
Bandjermasin ..	7,800	13,600	16,700	26,000	23,500	26,100	40	15,700
Pontianak	4,400	8,900	14,700	21,000	22,600	25,600	{ 20 ¹ 13 ² }	21,700
Palembang	900	4,500	9,200	17,900	17,100	22,500	30	15,700
Riow	3,300	5,700	8,000	10,200	10,300	11,700	12	10,200
Tapanoeli	1,700	2,700	3,800	6,000	6,700	7,300	10	6,600
Other Native ..	1,800	4,000	5,000	10,300	11,200	12,800	15 ³	10,900
Totals	29,400	56,500	79,700	120,300	121,300	142,500		99,000

¹Sambas. ²Pontianak. ³Estimated.

was "purely conjectural." The average yearly production of native rubber, according to the 1924-25 investigations was between 800 and 1,600 pounds to the acre in Djambi and from 550 to 620 pounds to the acre in Bandjermasin. Assuming an average for the residencies exclusive of Djambi as 575 pounds to the acre and for Djambi 1,200 pounds to the acre, the 1927 dry weight figures would indicate a planted acreage in bearing of about 350,000 acres. This figure is considerably below the planted acreage of native rubber in Malaya but in the latter country rice and other food products are generally not cultivated. In 1926, Malayan imports of rice were valued at over \$35,000,000, whereas Java with ten times the population of Malaya produced all of their food requirements. The native in the Dutch East Indies is therefore better situated economically to produce rubber than his brother in British Malaya but force of circumstances may cause the natives in the latter country to intensively cultivate rubber upon which they are in most cases solely dependent.

RUBBER FOOTWEAR EXPORTS IN MARCH WERE \$839,196, an increase over the February total of \$775,670.

Shock Insulated Automobile Seats

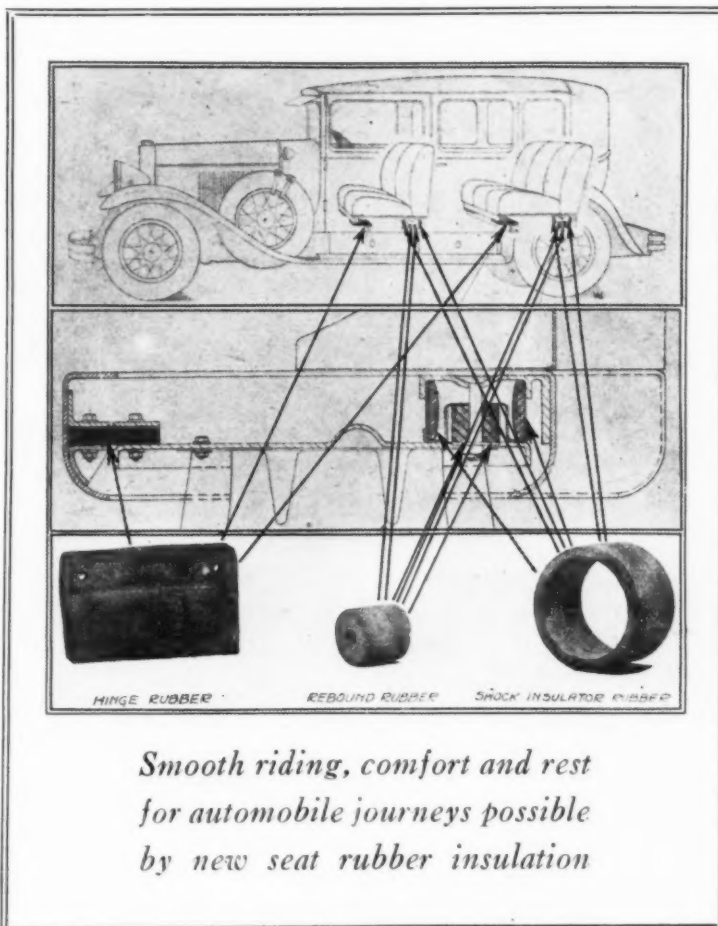
THE development of engines and chassis capable of allowing the present marked increase in speed of the ordinary automobile in private use necessarily involved many improvements in mechanism and equipment. Maintenance of riding comfort for the passengers, in particular, called for additional shock absorption, especially in the seats. Heretofore road shocks have been intercepted and reduced successively and collectively by the pneumatic tires, mechanical shock absorbers, and springs with or without interposed rubber insulation in spring shackles, between the chassis and engine, transmission, radiator, body and steering post. However spiral springs under the upholstery of the seats was the only method in use for absorption of vibration at that point.

The realization that a gentle motion of the seat upon which one rests or works conduces greatly to personal comfort, led automobile engineers and designers to a most satisfactory solution of the problem of automobile car seat design.

The achievement due to their efforts is embodied in the specially designed seat frame and mounting here pictured, for installation in private automobiles or buses.

The seat consists mainly of three units; the seat frame and back, the rubber shock insulators, and the supporting plate or pedestal. The main feature of the seat is the shock insulation which consists of a number of rubber insulators, according to the size of seat, fastened to the seat frame and resting on a supporting metal structure. This arrangement absorbs all shocks and vibrations and also gives maximum flexibility to the seat. This flexibility permits the back to recede slightly taking out the rigidity and adding in no small degree to the comfort of the passenger. The backs of the seats are made of sheet aluminum pressed into form fitting curves, giving very restful support to the back and assuring the least fatigue from long riding. This construction of the back effects a marked saving in space resulting in more liberal allowance of room for the limbs of adult riders.

The construction details of the seat proper showing the application and assembly of the rubber shock insulation is



*Smooth riding, comfort and rest
for automobile journeys possible
by new seat rubber insulation*

exhibited diagrammatically in the illustration where the thick, flat rubber hinge or plate is shown attached to the front edge of the seat base plate. The rear edge of the seat is carried on a two-part rubber construction. These parts consist of an outer cylindrical piece called the shock insulator rubber and a short stout rebound rubber cylinder located within the insulator rubber cylinder.

It will be seen that the rubber parts act under compression the amount of which is adjustable by the nut on the bolt passing through the rebound rubber. The finished seat is supplied with spring upholstered seat cushion such as commonly used on the ordinary uninsulated seat.

The construction described has been demonstrated in service to afford in marked degree the bodily comfort and

freedom from jolts that conduces to restful riding. It combines a yielding and form fitting back support with a seat floating on rubber supports. The combination thus formed not only eliminates road shocks and vibrations from the motive power but responds readily to every movement of the rider, thus contributing the rhythmic action conducive to easy and restful motoring.

The information and illustrations used in this article were supplied by the Rubber Shock Insulator Corp. of New York City.

Rubber Fluorescent Paint

A rubber-base paint which glows faintly in ordinary light and brightly when exposed to violet, ultra-violet, and X-rays, and which is designed for scenery and theatrical costumes, is formed from benzene, anthracene, pure rubber, and a vulcanizing agent such as sulphur chloride. L. J. Buttolph, U. S. Patent No. 1,658,476, February 7, 1928.

He may have greasy hands and the seat of his pants may be shiny, but if his children have their noses pressed against the window pane a half-hour before he is due home for supper, you can trust him with anything you have.—THE MIXING BOWL.

Pacific Goodrich's Gala Opening



WITH President James D. Tew of the new concern, and who is also head of The B. F. Goodrich Co. of Akron, officiating, and aided by many of the civic and industrial leaders of the Southwest, the Pacific Goodrich Rubber Co. celebrated with impressive exercises from May 2 to 5, inclusive, the formal opening of the latest of the parent company's branch factories, the spacious, self-contained plant recently erected in Los Angeles. Not only was the management heartily congratulated on its enterprise, but also on achieving through modified Mission architecture and attractive setting a rare combination of beauty and utility.

The dedicatory programme and luncheon were given at noon on Wednesday in the storeroom of the main building, the entrance hall being gaily decorated, and vocal and instrumental music being provided by a picturesquely attired Mexican troupe. A reception committee headed by the chief executives greeted over 800 invited guests and afterward helped to show the visitors through the factory. Secretary A. G. Arnoll of the Chamber of Commerce as toastmaster introduced George L. Eastman, president of the Chamber, who warmly welcomed the latest great addition to the city's industrial family. Fred T. Beaty, supervisor for the County of Los Angeles, also wished the new Goodrich company the utmost success. Greetings from the financial interests were extended by J. Dabney Day, president of the Citizens' National Trust & Savings Bank, and President Coffin of the Merchants & Manufacturers' Association assured the continuous cooperation of his organization. F. W. Robinson, of Omaha, vice president of the Union Pacific Railroad, declared that his company would do all in its power to aid the factory.

Investment Totals Ten Million

Mr. Tew said that he was greatly encouraged by such friendly assurances, and nowhere else had he found a more helpful spirit shown by all classes. Locating in Los An-

President Tew and other notables attend four-day celebration, and thousands study tire making in big, modern, attractive Los Angeles rubber plant.



geles was done only after a most thorough survey had been made in many places of industrial factors, and he was now thoroughly convinced that no mistake had been made in the selection of this as a producing and distributing center for the eleven far western states and trans-Pacific trade. Every vital requirement had been found, and many factors are so favorable as to warrant the belief that the Los Angeles plant may be operated at from 15 to 20 per cent less than a factory in Akron. Referring to the investment made, Mr. Tew said that land and buildings had cost fully \$3,500,000 and inventory and equipment \$6,500,000 more, or a total of \$10,000,000. The factory was already making over 2,000 tires a day and within a year it would probably be making 5,000, with 1,800 persons em-

ployed, and a yearly payroll of more than \$2,750,000. A similar address was given by Mr. Tew at night over the radio in introducing a Goodrich weekly programme which will be broadcast over the Pacific Coast network.

Besides those named, others at the guest table were: T. B. Tomkinson, of Akron, controller and director of the two Goodrich companies; Samuel B. Robertson, vice president and general manager of the Pacific company; F. C. Cory, auditor; E. S. Sargeant, treasurer; F. E. Titus, general sales manager; J. C. Herbert, secretary; F. A. Nied, factory superintendent; Edward Barry, resident engineer; and F. L. Hockensmith, Los Angeles branch manager.

Community Guests at Works

Fully 10,000 persons on Thursday accepted a general invitation to inspect the plant and to study intricate and large scale tire and tube making, many extra guides being provided to handle the throngs and to answer innumerable questions. The East Side Organization tendered the management a formal welcome, the girls' glee club and the men's quartet of Whittier College rendering selections, and addresses being made by President W. F. Dexter of the college, Secretary J. C. Herbert of the Goodrich company, President



C. R. Taylor of the Pasadena city directors, and many others. On Friday civic and service clubs and students of high schools and colleges in and near Los Angeles were factory guests. On Saturday "open house" closed after a veritable army of Los Angeles children and school teachers had received a memorable lesson in modern manufacturing.

Factory's Striking Features

The works were designed to be practically the last word in rubber factory construction, equipment, and general efficiency, and the intent of the planners appears to have been fully realized. Lost motion and material waste are reduced to a minimum. Especially notable are the new automatic features and the self-regulating devices. Little seems to be left to chance or to the often fallible human factor from the first handling of the rubber on through processes to the steam exterior and the hot water interior vulcanizing of tires.

The high lights of the new plant may be thus summarized: Land, 46 acres; floor space, 8 acres; piping, 30 miles; electric wiring, 42.6 miles; roof boards, 177 miles; glass, 3.2

acres, with 44,000 lights; brick, 3,000,000; rock and sand, 43,000 tons; cement, 32,000 barrels; monitor sash, 2.1 acres; structural steel, 1,850 tons; reinforcing steel, 251 tons; paint, 8,500 gallons; sprinkler heads, 5,075; Spanish tile, 30,000 square feet, 50,000 pounds; underground electric conduit, 10 miles; roofing material, 8 acres; copper flashing, 30 tons; fire doors, area 4,500 square feet; plastered walls, 16,600 square feet; railroad tracks, 3,500 lineal feet; electric lights, 2,275; fencing, 4,533 lineal feet; building frontage, 1,700 lineal feet by 200 to 240 feet wide; reinforcing steel mesh, 381,000 square feet; deep water wells, capacity 2,000 gallons per minute; reservoir, 200,000 gallons; boilers, 3,000 h.p. capacity, super-heaters, automatic control, air preheater, using gas or oil; water softening outfit, 12,000 gallons hourly capacity; substation, 6,000 K. V. A.; refrigeration machine, 300 tons capacity; motors, 7,000 h.p., four being 500-h.p.; hydraulic pumps with from 250 to 500 pounds pressure; water service pumps, 1,500 gallons per minute; motor generator sets, 1,200 k.w.; fire pumps, 2,000 gallons per minute; air compressors, 1,000 cubic feet per minute.

S. A. E. for Fewer Rim Sizes

Tire Manufacturers Encouraged With Automobile Engineers' Cooperation in Limiting Casing Dimensions

When the balloon tire made its debut one prominent rubber manufacturer remarked, "Now is the time to undo the mistakes of the past. If we cannot get rid of the maze of old high pressure tire sizes, let us at least start right on the new low pressures and make just four standard sizes." But unfortunately the balloon tidal wave, with its demands for all sort of sizes, fairly swept him off his feet, his good suggestion was drowned in the swirling flood, and since his factory has been forced through competition to turn out its share of not four but some forty-four different, and mostly unnecessary, balloon sizes.

The uneconomic condition has given forward-looking tire makers much anxiety, and many protests have been voiced by tire dealers forced to carry an unnecessarily large stock of tires in a wide range of sizes, but neither makers nor dealers seemed to be able to get very far with their objections. Engineers designing new types of cars with special rims requiring odd sizes of tires have borne most of the blame for defeating the efforts of dealers and manufacturers to lessen the number of tire sizes. Many tire makers have yielded unwillingly to

car builders' demand, realizing that if they were reluctant about investing in new tire molds others would be only too glad to provide the equipment.

While tire makers and dealers were almost despairing of any relief, the Rubber Association of America was leaving no stone unturned to bring about better conditions, and had particularly impressed upon the National Automobile Chamber of Commerce and the Society of Automotive Engineers the advantages of simplification. Now the prospect for the elimination of many little-used balloon tire sizes and for checking the addition of any more size varieties is quite encouraging. The tire manufacturers attach especial importance to the recent decision of the S. A. E. to help the good work along by adopting a report of the Tire and Rim Committee calling for the standardization of six rim sizes. It is held that by confining rim sizes to such a graded series tires for original equipment will be practically limited to the following nominal sizes: 28 by 5.25, 29 by 5.00, 29 by 5.50, 30 by 4.50, 30 by 6.00, 31 by 6.00, 32 by 6.00, and 32 by 6.75.

EDITORIALS

Are Planters Downhearted?

ANSWERING a query at the annual meeting of stockholders as to what the company would do should restriction be abolished, Herbert Wright, chairman, of the Lavant Rubber Co., Ltd., said that he was not worried about the impending change. He had been advised, he said, that the company, which operates an average Ceylon estate, "could produce its full crop at a cost that would enable it to meet any competition that might be contemplated." Doubtless those in control of most of the other efficiently-managed plantations in the Far East likewise view with resignation (some perhaps with satisfaction) the passing of the trade-fettering Stevenson Act.

Even low-priced rubber brought about by abolition of the regulatory law for exports may be a blessing in disguise, according to spokesmen for some British planting interests. "If," says one such authority, "rubber stays for awhile well within one shilling, manufacturers will be easily persuaded to use it instead of reclaim, even though the latter may be somewhat cheaper; and thus would a demand for crude be created that would absorb as much of that commodity as restriction has kept off the market in any one year."



Why Sole Tire Distributors Are Few

THE question is often asked, why do not rubber manufacturers, especially those making tires, have more sole distributors, or market their products directly to ultimate consumers through retail factory branches, instead of depending on wholesale and retail dealers who handle competitive lines? It is argued that the producers, having through proved merit and extensive advertising established high reputation and strong demand for their goods, should and could reap the exclusive benefit of the prestige thus acquired. But, granting the fairness of such contention, it may be observed that changing the common sales policy may be neither easy nor expedient.

Familiar experience with a wide range of nationally-known products teaches that it is not economic to ignore the capable middleman if cheap, swift, and thorough distribution be desired. The manufacturer who would start out to cover the country with retail service stations would not only have to make an immense capital outlay and organize a huge sales army, but he would antagonize some of the keenest tire merchants in the country. Exclusive distributors are desirable, but the best are hard to get and often hard to hold. Many enterprising tire dealers will not tie down to one line.

One of the leading American tire makers spent half a

day trying to coax a firm handling his largest dealer account (over \$500,000) to become a 100-per-center, only to be convinced that the firm could not guarantee him as much business if it were denied the privilege of dealing in several other standard brands of tires. The firm proved that it was the choice variety, as also good service, that brought in customers and that rolled up the big total.

The point may be made, too, that small tire factories might succeed better than large ones in a direct retailing venture. The territory of the former being limited, selling conditions can be more easily controlled, and the task of keeping a sales force intact should be less difficult than with the latter. Opportunities offered in carrying diversified lines would probably cause more defections in a large than in a small sales organization. A retail branch head, for instance, would have a strong sense of loyalty and would "stick by his guns" despite the fact that he could see plainly how by setting up in business for himself and carrying assorted lines he could as easily double his earnings. Hence it is that the average rubber manufacturer would rather bear those ills he has, and not change his sales policy.



Trial Order Trickery

THAT slick salesmen placing "trial orders" for foreign concerns have been grossly imposing upon American factory executives is revealed by the National Association of Purchasing Agents, Inc. Letters from great banks abroad and fine samples are often used as bait; and through ingeniously worded billing and misleading reckoning in foreign money and metric measurements, buyers have even been trapped into signing for \$9,000 worth of common tools, tool steel, metallic packing, etc., while expecting a bill for about \$30. If cancellation be ordered, accounts are sold or buyers badgered with threats. However, the association will generously aid victims to make a test case; and it advises in placing orders with unknown concerns to specify the exact number of units in a purchase, and to insist upon free delivery, payment in dollars only, and that goods shall correspond precisely with sample submitted.



FOR safety, police are increasingly insisting upon automobile drivers keeping brakes in effective condition. Perhaps they will be equally solicitous about the state of tires when they learn that recent exacting tests showed that worn casings are on an average 30 per cent more "skiddy" than new tires. Rather a good argument, too, for more frequent replacement and which should appeal particularly to careful motorists.

What the Rubber Chemists Are Doing

Method for Retarding Scorching

A. A. SOMERVILLE

THE practice in recent years to shorten cures at lower heats has been hindered by the tendency of the rubber to scorch on the mill. The sensitiveness to heat of the so-called ultra-accelerators necessitates the exercise of special care to obviate this trouble. While water has been added to the batches to reduce the heat of milling, an even better means has been discovered recently and is rapidly finding favor. It consists in adding to the mixing a small proportion of litharge. This method has been thoroughly tested in connection with the use of the accelerator Tuads in stocks containing carbon black, reclaim, zinc oxide whitening, thermatomic carbon and Vandex. The results may be summarized thus:

A small amount of litharge added to such accelerated compounds will retard the curing at low temperatures and accordingly prevent scorching or air curing but will permit very quick cures at higher

various amounts of litharge at different temperatures on a tread stock containing carbon black. Similar pronounced practical results have been demonstrated by systematic tests of series of stocks containing large percentages respectively of zinc oxide, whitening carbon black and reclaim, and thermatomic carbon, with and without the presence of Vandex and stearic acid.

In making these tests a progressive series of mold cures was used with steam pressures of 2½, 10, 20 40 and 60 pounds. In other words at heats of 220, 240, 258, 287 and 307 degrees F. respectively.

Examination of the tensiles and elongations obtained by curing the mixings under specified conditions will show very clearly the remarkable protection against scorching afforded throughout the wide range in time and heat by the minute percentages of litharge in the mixing. For example compound C containing no litharge does not attain full cure even in 90 minutes at 220 degrees. The other mixings show no cure at this heat.

The remarkable effect of one per cent and less of litharge in

LITHARGE AND TUADS IN A TREAD STOCK

	C	C-1	C-2	C-3	C-4	C-5
Smoked sheets	100	100	100	100	100	100
Barbour black	40	40	40	40	40	40
Pin tar	3	3	3	3	3	3
Hard hydrocarbon	3	3	3	3	3	3
Stearic acid	4	4	4	4	4	4
Sulphur	3	3	3	3	3	3
Zinc oxide	5	5	5	5	5	5
Tuads	¼	¼	¼	¼	¼	¼
AgeKite resin	1	1	1	1	1	1
Litharge	..	1	¼	¼	¼	¼
Time and steam	60@2½	75@2½	90@2½			
C	2440 770	3930 735	4270 710			
C-1	U.C.	U.C.	U.C.			
C-2	U.C.	U.C.	U.C.			
C-3	U.C.	1100 630	1220 630			
C-4	U.C.	1720 630	1920 640			
C-5	U.C.		2960 645			
Time and steam	25@10	30@10	45@10	60@10		75@10
C	2050 680	3590 780	4290 740	4510 720		4520 690
C-1	U.C.	U.C.	1780 720	2210 750		2480 720
C-2	U.C.	U.C.	1830 740	2030 770		2400 710
C-3	U.C.	1240 730	2250 730	2390 690		3080 680
C-4	U.C.	1960 730	2500 665	2900 720		3680 710
C-5	880 670	2270 700	3210 670	4140 730		4450 720
Time and steam	10@20	20@20	30@20	45@20		60@20
C	395 2540 740	730 4530 750	890 4500 730	1000 4450 710		1140 4500 680
C-1	U.C.	335 2060 710	480 3040 730	695 3820 780		910 4350 730
C-2	U.C.	310 2110 730	435 2680 725	680 3640 715		960 4150 725
C-3	215 1130 670	475 2580 690	680 3440 690	740 4120 720		1070 4400 665
C-4	370 2180 700	605 3310 730	725 3860 720	910 4250 700		1020 4320 700
C-5	425 2170 680	690 3880 730	890 4280 730	1010 4500 680		1160 4410 680
Time and steam	5@40	10@40	20@40	30@40		
C	490 3060 735	730 4220 765	920 4379 720	1020 4250 710		
C-1	440 2170 740	605 3320 735	960 4400 720	1100 4250 690		
C-2	310 2030 720	625 3320 720	955 4360 710	1130 4450 670		
C-3	525 2760 690	730 3840 710	1000 4430 700	1190 4610 655		
C-4	570 3010 700	825 4180 715	1100 4480 690	1110 4420 650		
C-5	640 3220 720	870 4470 700	1060 4580 720	1200 4420 680		
Time and steam	5@60	10@60	20@60			
C	730 4180 725	840 4000 690	850 3810 700			
C-1	685 4020 740	1110 4500 700	1080 4010 670			
C-2	640 4080 750	1050 4570 700	1120 4130 670			
C-3	890 4220 690	1160 4520 680	1170 4280 650			
C-4	845 4340 730	1100 4470 675	1200 4120 645			
C-5	815 4410 720	1070 4380 690	1050 3800 680			

(The letters "U.C." are used to indicate an uncured stock.)

temperatures. Lead oleate is also an effective retarder at low temperatures when similarly used. Lead peroxide also acts effectively to retard or prevent curing at low temperatures but it is a bad ager. Barium peroxide is slightly effective to prevent premature curing but to some extent injures the cure at higher temperatures and in addition it is not a good ager.

The accompanying tabulation of tests exhibits the effect of

rubber mixings is clearly evident by examination of the tensiles and elongations obtained under the curing conditions recorded in the table. For example, only stock C exhibited any cure in 60 minutes at 2½ pounds simply because it contained no litharge. At 75 minutes stocks C-4 and C-5, containing three and two ounces respectively of litharge began curing and stock C advanced strongly in cure being unrestrained by litharge. In the 90 minute heat C-3.

with four ounces of litharge began to cure and C-4 and C-5 advanced strongly. But the 90 minute C-1 and C-2 still remained uncured proving that eight ounces or over of litharge fully protected them from vulcanizing effect up to 90 minutes at $2\frac{1}{2}$ pounds or 220° F.

In the second series the time range extends from 25 minutes to 75 minutes at 20 degrees higher heat, 10 pounds steam or 240 degrees F. Here the instances of protection against cure are fewer and limited to the 25 and 30 minute heats. In this series the compound C containing no litharge comes to full cure, 4,520 pounds tensile in 75 minutes cure. Also C-5 with only two ounces of litharge is essentially full cured at that heat.

In the third series the heat is raised practically 20 degrees above that of the second series and the times of cure range from 10 to 60 minutes. Only C-1 and C-2 containing one pound and $\frac{1}{2}$ -pound of litharge respectively remain uncured in the first or 10 minute cure. The other stocks successively approximate full cure as the time increases and average not far apart in tensile at 60 minutes cure.

In the fourth and fifth series the influence of the litharge proportions are still evident.

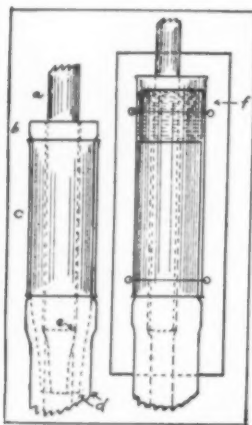
A Clamp for Rubber Tubing¹

HAROLD W. BATCHELOR

THE following method of clamping rubber tubing to glass tubing for general laboratory apparatus or for pressure or vacuum systems has been found very satisfactory.

A sleeve, *c*, approximately $1\frac{1}{2}$ inches (3.8 cm.) long may be made of thin glass tubing whose inside diameter is but slightly larger than the outside diameter of the tubing to be used. The sleeve is first slipped several inches on the rubber tubing. The tubing is then slipped into place on the glass tubing, *a*. While holding both the glass and the rubber tubing at *b*, the latter is

stretched slightly so that it assumes the position indicated by the dotted lines at *d*. The glass sleeve is then put in position and the rubber tubing worked back into position as shown by the heavy lines at *d*.



Rubber Tubing Clamp

When the rubber tubing has been properly worked into position, the clamp is so effective that it is practically impossible to remove the tubing when pulling at *b*. By stretching the tubing again at *d* and removing the sleeve, the two tubes can be easily separated again. Though not usually necessary, the clamping effect may be increased by slightly widening the end of the glass tubing at *e*.

If the clamp is used in the construction of gas-analysis apparatus, a mercury seal would scarcely be necessary, since the rubber tube is clamped uniformly throughout its circumference. The clamp may be modified, however, to form a cup for a mercury seal as shown at *f*. A mercury seal to connect two rubber tubes can be easily prepared by welding a side arm at the midpoint of the sleeve. Such a cup can be used either with a straight side arm in a horizontal position or in a vertical position with the side arm bent to a vertical position.

The sleeve also affords an excellent protection for the rubber tubing if it is necessary to wire it in position on a base as shown. It is hoped to make available in the near future either metal or other tubes for this purpose.

¹*Indus. & Engr. Chem.*, April, 1928, p. 366.

Footwear from Old Tires

Native Greeks and Mexicans Wear Sandals of Rubber

The peasants in Greek Macedonia and Thrace have adopted a modern form of footwear made from old casings. The tcharik, the rough footwear of the villages, was formerly composed of a strip of leather held around the foot with a leather lacing passed several times around the ankle and calf over thick stockings. A hide tcharik lasted from one and a half to two



Rubber Tcharik from Greece

months, whereas the rubber tcharik wears from eight to twelve months.

Because of its economy and protection from dampness, the rubber tcharik has quickly gained favor with the peasants in spite of its greater weight. One old casing will yield three pairs. Indeed, so popular has this rubber footwear become that automobile casings are not worn out fast enough to supply the demand, it being estimated that at least 50,000 old casings are imported annually through the port of Saloniki.

Local automobile operators use their tires up to the limit, so that the supply must be imported, France holding a monopoly of this trade. About 10 or 15 per cent of the total casings imported are considered so good that they are bought by the chauffeurs for their own use and can be made to last from three to five weeks. Fabric casings bring better prices to the sellers because the double lining is taken out for use in the making of inferior tchariks or for the strips which fasten the shoe to the feet.

The peons of Mexico have also adopted this method in making their guaraches but, unlike Greece, the country has a larger consumption of automobile casings and is not dependent upon an outside source for its supply. For this footwear a piece of rubber is cut into the shape of the sole and attached to the foot by means of leather thongs.

Import duty will prohibit the importation of the casings to Mexico in any great numbers as the rate is the same as for new casings. In Greece, however, the duty averages 35 to 40 drachmas each, a drachma, at the present rate of exchange, equals \$0.0133.

—*Commerce Reports.*

When Is Rubber Unregenerate?

The notion that rubber has more lives than the proverbial cat is strengthened by the statement made by G. W. Miller at the recent St. Louis meeting of the Rubber Division of the American Chemical Society. Having cured a sample of whole tire reclaim, he regenerated it three times and noted results. Vulcanized in a low-quality tread compound, it showed in the successive cycles a steadily decreasing elongation and tensile, with increasing modulus; yet it withstood artificial aging surprisingly well, giving the impression that it might undergo many more transmigrations before being finally rejected as a hopeless unregenerate. Possibly if crude rubber could get and stay well above 25 cents per pound, or the so-called zero point for reclaiming, cured rubber might be reborn for ages.

American Rubber Technologists

These brief biographies of American rubber technologists are approved by leaders of the rubber industry. Technical superintendents, chemists, process and development engineers in rubber manufacturing and reclaiming plants, research, testing, and service laboratories are invited to send their biographical data to us for publication.

George L. Clark, chem. b. Sept. 6, 1892, Anderson, Ind.; A. B., DePauw U., 1914; M. S., U. of Chicago, 1914; Ph. D., U. of Chicago, 1918; instr. chem., DePauw U., 1914; Lieut. C. W. S., 1918; prof. chem., Vanderbilt U., 1919-1921; Natl. Research Fellow, Harvard U., 1922-1924; prof. applied chem. research and director X-ray research lab., Mass. Inst. of Tech. since 1924. *Author:* Marburg Lecture, 1927, "The X-Ray Examination of Materials in Industry." *Member:* Am. Chem. Soc., Am. Phys. Soc., A. S. T. M. Committee E-4, asst. editor *Chem. Abstracts*. *Address:* Mass. Inst. of Tech., Cambridge, Mass.

Joseph Donald Doyle, chem. b. Sept. 16, 1890, Ashland, Mass.; Dartmouth Coll., 1912; Harvard Graduate School; newspaper work, 1912-1915; Harvard and Boston Transit Commission, 1915-1916; chem. 1916-1922, chf. chem. 1922-1927, Am. Optical Co.; asst. supt. since 1927, U. S. Rubber Co., sundries factory, Providence, R. I. *Member:* Providence Engr. Soc., Dartmouth Club of R. I., Asso. of Harvard Chemists. *Address:* 16 Elmhurst Ave., Providence, R. I.

Walter C. Weller, chem. b. Nov. 19, 1897, Bayonne, N. J.; B. S., Rutgers U., 1919; lab. and devel. work, Morgan & Wright, Detroit, Mich., 1919-1923; asst. pur. agt., Howe Rubber Corp., New Brunswick, N. J., 1924; sales dept., Binney & Smith Co., New York, N. Y., 1924-1926; sales dept., Wishnick-Tumpey, Inc., New York, N. Y. since 1926. *Member:* Phi Gamma Delta. *Address:* 125 Main St., Orange, N. J.

James Ross Belton, chem. engr., b. Oct. 27, 1895, London, Can.; London Collegiate Inst., U. of Toronto, Toronto; Queen's U., Kingston, Can., B. S. 1920; Gutta Percha & Rubber, Ltd., Toronto, student worker, summer of 1921; asst. supervisor planning dept., 1921-1922; supervisor planning dept. since 1922. *Member:* Amer. Management Asso., Soc. of Industrial Engineering, Delta Kappa Epsilon. *Address:* 130 O'Hara Ave., Toronto, Can.

A. R. Nichols, chem. b. Oct. 10, 1893, Wickford, R. I.; Brown U., 1917; chem. testing dept., 1918; asst. chem. sundries factory, 1919-1922; chf. chem. hard rubber factory, 1922-1924; chf. chem. of both factories since 1927, U. S. Rubber Co., Providence, R. I. *Address:* U. S. Rubber Co., Providence, R. I.

Frank M. Kennedy, chem. b. 1875, Bridgeport, Conn.; inspector and chem. Underwriters Lab., 1905-1913; supt. rubber covered wire, E. F. Phillips Elec. Works, Montreal, 1913-1914; munitions, engr. dept., 1915-1917; chem. W. B. Pratt, Inc., Boston, 1917-1925; chem., Archer Rubber Co.,

Milford, Mass., since 1925. *Address:* 31 Emmons St., Milford, Mass.

Daniel J. Millwood, supt. b. Oct. 13, 1896, New York, N. Y.; public school graduate; Adams Express Co., 1918-1920; mgr. mill and calender dept., Manhattan Rubber Mfg. Co., since 1920. *Address:* 280 Gregory Ave., Passaic, N. J.

Warren E. Glancy, chem. engr. b. 1890, Waltham, Mass.; S. B., Mass. Inst. Tech., 1913; lab. asst. analytical chem., M. I. T., 1913-1914; lab. asst., Hood Rubber Co., Watertown, Mass., 1915-1918; Chem. Warfare Service, 1918; research chem., 1919-1920; asst. mgr. lab., 1920-1922; mgr. lab. since 1923, Hood Rubber Co. *Author:* Papers on hard rubber and some patents. *Member:* Am. Chem. Soc., Am. Inst. of Chemists, A. A. A. S., Lambda Chi Alpha, American Legion, Mason. *Address:* Hood Rubber Co., Watertown, Mass.

Edmund James Dempsey, chem. engr. b. Apr. 9, 1894, Worth, Ill.; B. S., U. of Maine, 1917; chem., 1917-1918; foreman, mill and calender depts., 1919-1921; Converse Rubber Shoe Co., Malden, Mass.; asst. supt., Cambridge Rubber Co., 1921-1925; fact. mgr., Phillips-Baker Rubber Co., Providence, R. I., since 1925. *Author:* Papers on footwear manufacturing practice, stock handling devices, patents on small machines for folding, etc. *Member:* Sigma Chi, Alpha Chi Sigma, Mason. *Address:* 46 Hanover St., Providence, R. I.

Alfred Beverly Lingley, chem. engr. b. Sept. 17, 1897, McAdam Jct., New Brunswick, Can.; B. S., U. of Maine, 1920; foreman, successively of mill, varnishing, curing and packing rooms, Converse Rubber Shoe Co., Malden, Mass., 1920-1925; supt., Phillips-Baker Rubber Co., Providence, R. I., since 1925. *Member:* Sigma Chi, Alpha Chi Sigma, Mason, Shriner. *Address:* 47 Woodman St., Providence, R. I.

Vinal N. Hastings, chem. engr. b. Aug. 18, 1900, Greenlake, Me.; B. S., R. I. State Coll., 1922; chem., 1922-1924; asst. chf. chem., 1924-1925; chf. chem. since 1925, National India Rubber Co., Bristol, R. I. *Member:* Theta Chi, Phi Kappa Phi, Mason. *Address:* 119 High St., Bristol, R. I.

Seward Groves Byam, chem. b. Feb. 24, 1894, Rome, N. Y.; Ph. B., Brown U., 1916; chem., U. S. Rubber Co., Providence, R. I., 1916-1918; chem., General Aircraft Laboratories, Pittsburgh, Pa., 1918-1919; chf. chem., duPont Co., Fairfield, Conn., 1919-1921; genl. supt., Plymouth Rubber Co., Canton, Mass., 1921-1925; asst. plant mgr., duPont Co., Fairfield, Conn., since 1925. *Author:* Articles on "Proofing of Fabrics." *Member:*

Sigma Chi, Am. Chem. Soc. *Address:* duPont Co., Fairfield, Conn.

Joseph Boies Fuller, engr. b. Apr. 25, 1903, Scranton, Pa.; Hotchkiss School, 1922; B. S., Wesleyan U., 1926; supt. hose dept., Manhattan Rubber Mfg. Co., Passaic, N. J., since 1924. *Member:* Phi Nu Theta, Socratic Literary Soc. *Address:* 7 Brunswick Rd., Montclair, N. J.

Richard Raymond Taylor, chem. engr. b. April, 23, 1886, Dalton, N. H.; S. B., Mass. Inst. Tech., 1910; research asst. in organic chemistry, M. I. T., 1910; chem., Apsley Rubber Co., Hudson, Mass., 1911-1917; chem., Goodyears' Metallic Rubber Shoe Co., Naugatuck, Conn., 1917-1919; chem. engr., U. S. Rubber Co., New Haven, Conn., since 1919. *Member:* Masons. *Address:* P. O. Box 606, New Haven, Conn.

William E. Downs, chem. engr. b. July 24, 1893, South Portland, Me.; graduated Pratt Inst., Brooklyn, N. Y., 1915; research lab., Chas. Pfizer & Co., Brooklyn, N. Y., 1915; chem., Norwalk Tire & Rubber Co., Norwalk, Conn., 1916-1918; chem., N. J. Carspring & Rubber Co., Jersey City, N. J., 1918-1919; chem., Mayflower Rubber Co., South Braintree, Mass., 1919-1920; chf. chem. and asst. supt., Vulcan Proofing Co., Brooklyn, N. Y., since 1921. *Member:* Mason, Shriner. *Address:* Vulcan Proofing Co., 57th St. and 1st Ave., Brooklyn, N. Y.

John J. Rooney, chem. b. Apr. 20, 1894, Boston, Mass.; Harvard Coll., 1917; asst. chem. dept., Boston U., 1917-1919; chem., Boston Woven H. & R. Co., Cambridge, Mass., 1919-1924; tech. supt., Quabaz Rubber Co., N. Brookfield, Mass., 1924-1926; pres. and treas., Travelite Rubber Co., Boston, Mass., since 1927. *Member:* Am. Chem. Soc., Harvard Club of Boston, Kappa Sigma. *Address:* 60 South St., Boston, Mass.

Maurice Kennard Stevens, chem. b. 1888, Lynn, Mass.; A. B., Harvard, 1909; Harvard Graduate School, 1915-1917; asst. chem., Norwalk T. & R. Co., 1917; chf. chem., rubber works, Whitall Tatum Co.; chf. chem., Quaker City Rubber Co., Philadelphia, Pa.; consu'ting rubber chem., Elizabeth, N. J. *Member:* Am. Chem. Soc., Asso. of Harvard Chemists, Mason. *Address:* 706 Rahway Rd., Elizabeth, N. J.

Walter F. Thomas, indus. engr. b. Dec. 28, 1888, Melrose, Mass.; Dartmouth Coll., 1912; pur. agent, Tyler Rubber Co., Andover, Mass.; indus. engr., U. S. Rubber Co., New Haven, Conn.; supt. sundries dept., Goodyear I. R. Glove Co., Naugatuck, Conn.; facty. mgr., Omo Mfg. Co., Middletown, Conn.; asst. to treas., Lowell Insulated Wire Co., Lowell, Mass. *Member:* Mason, Theta Delta Chi. *Address:* 137 Fairmount St., Lowell, Mass.

Editor's Book Table

Book Reviews

"Representative Industries in the United States." Edited by H. T. Warshaw. Henry Holt & Co., New York. Cloth, 702 pp., 5½ by 8½ inches. Illustrated, Indexed.

This volume contains information of vital practical value to all interested in the development of modern American industry presented in twenty-one chapters. The authors of the various chapters are leaders in their respective industries and cover in a general way a brief history of the industry, the conditions surrounding its origin in the United States, its relations to American industry as a whole, the growth of its domestic trade, the improvements of its technological processes, the growth of its export business, a discussion of its labor problems, a brief history of its consolidations and special developments.

The chapter on the rubber industry by Paul W. Litchfield, president of The Goodyear Tire & Rubber Co., Akron, O., will be read with special interest by the personnel of the rubber industry.

"Experimental Tapping of Hevea Rubber Trees at Bayeux, Haiti, 1924-25," by Loren G. Polhamus. Technical Bulletin No. 65, U. S. Dept. of Agriculture, Washington, D. C. Paper, 32 pp., 6 x 9 inches. Diagrams, tables.

In this study plantings of species of *Castilla*, *Hevea*, *Manihot*, *Ficus*, *Mimusops* and *Funtumia* were utilized. With the exception of the *Castilla* none of the species had been tapped regularly. The results are given in detail and summarized.

New Publications

"High Pressure Yarway Blow-off Valves." A 4-page bulletin, B-415, issued by Yarnall-Waring Co., Chestnut Hill, Philadelphia, Pa., embraces a list of 1927 installations of its blow-off valves in 73 manufacturing concerns in the United States.

"Descriptions of Products" is the title of an 18-page pamphlet by the Commercial Solvents Corp., New York, N. Y. A comprehensive diagram shows the products described and their industrial uses.

Bristol's Counters. This four-page illustrated circular just issued by The Bristol Co., Waterbury, Conn., describes six different models of counters and shows pictures of their application for checking the output of various automatic machines.

"Day 'Mogul' Experimental Kneading Machine." This 12-page bulletin issued by The J. H. Day Co., Cincinnati, O., contains full illustrated descriptions of the latest developments in experimental mixers in various types adapted for the study of manufacturing problems.

The F. R. Henderson Corp., 44 Beaver St., New York, N. Y., has compiled for the rubber trade its 1927 annual series of charts. They consist of concise graphic representations of various phases of the rubber and allied industries, covering a period of years.

The Statistical Bulletin of the Philippine Islands, ninth number, has been compiled and published by the Bureau of Commerce & Industry, Manila. It covers all available data for the year 1926 and contains a map showing the position of the Philippines in relation to the world's trade routes. Charts and graphs have also been included for those who have no time to delve into all its wealth of figures.

The Davol Rubber Co., Providence, R. I., has issued a 16-page booklet, *The Davol Dealer*. It contains many helpful suggestions with appropriate illustrations scattered throughout its pages.

"Commercial News Bulletin No. 1." The Division of Commerce, Buitenzorg, Java. The Expected Production of Native Rubber in the Dutch East Indies, by A. Luytjes. This report discusses the production of native rubber as a factor in the crude rubber trade and recommends that it be watched as an important source of production and to avoid dealing with this subject as if it were a matter of only secondary importance.

Rubber Bibliography

PREPARATION OF BUTADIENE. Stanley F. Birch, *Indus. & Eng. Chem.*, May, 1928, pp., 474-5.

ALDOL-X-NAPHTHYLAMINE AS AN ANTI-OXIDANT FOR RUBBER. H. Klopstock, *Kaut.*, 1928, Vol. 4, p. 40.

ALDOL-X-NAPHTHYLAMINE. W. Esch, *Kaut.*, 1928, Vol. 4, p. 10.

APPLICATION OF THE QUARTZ LAMP IN RUBBER LABORATORIES. F. Kirchhof, *Kaut.*, 1928, Vol. 4, pp. 24-27.

COMPARISON OF ZINC OXIDE, LITHOPONE, ZINC SULPHIDE, AND TITANIUM DIOXIDE IN RUBBER FILMS VULCANIZED WITH SULPHUR CHLORIDE. R. Ditmar and G. Ballog, *Gummi-Zeit.*, 1928, Vol. 42, pp. 1303-4.

ELECTROLYTIC PRECIPITATION OF FRESH AND PRESERVED LATICES AND THE ROLE OF THE ALBUMIN IN COAGULATION. P. Scholz, *Kaut.*, 1928, Vol. 4, pp. 5-8.

MEASUREMENT OF RESISTANCE OF VULCANIZED RUBBER TO PENETRATION OF BENZENE AND OTHER COMBUSTIBLE SUBSTANCES. F. C. Schmelkes, *Indus. & Eng. Chem.*, April, 1928, p. 430.

DIRECT DETERMINATION OF RUBBER IN SOFT VULCANIZED RUBBER. A. R. Kemp, W. S. Bishop, and T. J. Lackner, *Indus. & Eng. Chem.*, April, 1928, pp. 427-430.

FURTHER EXPERIMENTS ON THE INFLUENCE OF FATTY ACIDS ON VULCANIZATION. G. S. Whitby and B. A. Evans, *J. Soc. Chem. Indus.*, May 4, 1928, pp. 122T-126-T. Graphs.

EFFECT OF HEAT ON RAW RUBBER. C. R. Park, C. M. Carson, and L. B. Sebrell, *Indus. & Eng. Chem.*, May, 1928, pp. 478-483. Tables and graphs.

NORMAL AGING OF COMPOUNDED RUBBER. R. H. McKee and H. A. Depew, *Indus. & Engr. Chem.*, May, 1928, pp. 484-491. Illustrations, tables and graphs.

NOTES ON RUBBER MANUFACTURE. T. E. H. O'Brien, *Trop. Agr. (Ceylon)*, 69, pp. 197-201 (1927).

CHANGES IN METHODS AND TREATMENT OF MATERIALS POSSIBLE BY APPLICATION OF THE THEORY OF ANTIOXYGENS. J. Dugué, *Compt. Rend.*, 185, p. 91 (1927).

LARGE MIXING MACHINES AND THEIR PROPER USE IN RUBBER AND CABLE FACTORIES. W. Esch, *Kaut.*, 1928, pp. 16-22.

TEST OF THE ADHESIVENESS OF RUBBER TAPE. Lothar Hock, *Gummi-Zeit.*, 42, p. 1028 (1928).

THE TECHNIC OF VULCANIZATION. A. M. Munro, *Chem. Eng. Mining Rev.*, 20, pp. 98-103 (1927).

NEW METHODS OF VULCANIZATION. A. Brintet, *Rev. gén. mat. plastiques*, 3, pp. 585-90.

COLOR REACTIONS OF RUBBER. H. Pauly, *J. Prakt. Chem.*, 118, pp. 48-52 (1928).

NEW PROCESS FOR CURING CORD TIRES AND MOLDED TUBES. H. R. Minor, *Ind. Eng. Chem.*, March, 1928, pp. 291-4.

ON THE ROTARY POWER AND THE MELTING POINT OF THE RESINS IN GUTTA PERCHA, BALATA AND ALLIED GUMS. S. Minatoya and H. Kaneko. Researches of the Electrotechnical Laboratory, Jan. 1928, Japan. English synopsis.

THE MANUFACTURE OF GUTTA PERCHA SLABS OR SHEETS (translated from *Gummi-Zeit.*). Anonymous, *Ind. Rubber J.*, May 5, 1928, p. 670.

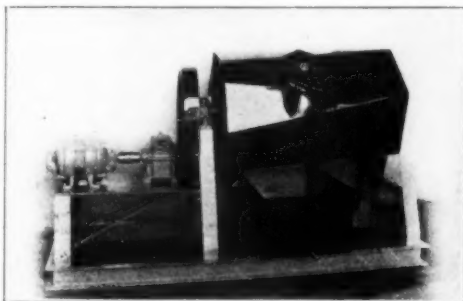
DISTRIBUTION OF FILLERS IN RUBBER MIXING. S. Reimer, *Gummi-Zeit.*, 1928, Vol. 43, pp. 1359-60.

POWER CONSUMPTION IN THE PREPARATION OF CREPE RUBBER. M. Schröter and R. Riebl, *Med. Proefstat. Rubber*, Buitenzorg, 1927 (22), pp. 397-419, and *Archief*, 1927, 11, p. 8.

New Machines and Appliances

Cement Mixer

A new horizontal cement mixer, the outcome of years of experience and development is here pictured. No fewer than 12 different types were studied for selection of the one now perfected. This mixer has few working parts, light in weight yet has life-time durability. It is of barrel type, well proportioned riveted and soldered inside and out to prevent leakage. A 9-inch brass filler cap with lip on opposite sides and a quick opening clamp cover



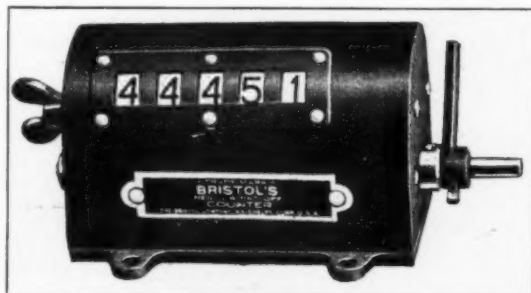
The R. D. Quin Mixer

attachment enable the operator to draw off the cement from the top free from any sediment. The barrel is so shaped that nothing is needed inside it to effect quick and thorough mixing. This is done by triangular iron plates which automatically work the contents from end to end and over and over as the churn revolves.

The machine is particularly successful for mixing glue with water for compounding into rubber. This process requires only from 10 to 15 minutes' churning without the use of steam.—The Akron Standard Mold Co., Akron, O.

Revolution Counter

A revolution counter is a most convenient and indispensable means for checking production, especially of automatic machinery. The illustration represents a counter of barrel type which makes possible the checking of intricate details of operation with a mechanical precision which permits no error, thus saving waste



Bristol Counter—Model 1265

of time and material incident to hand counting and providing an intelligent basis for analyzing machine production for casting purposes, etc.

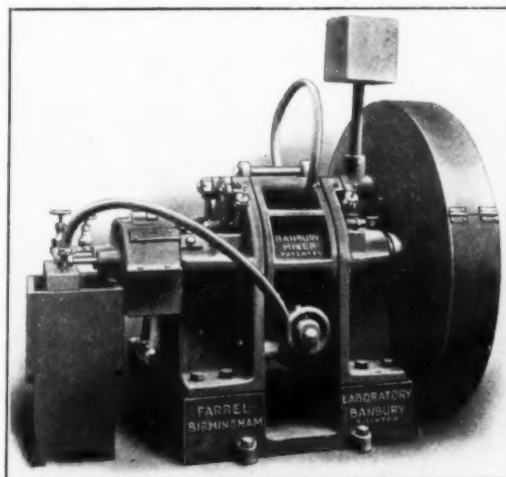
The model 1265 here pictured is arranged for counting up to 99,999. Upon reaching these figures it automatically resets to zero. A thumb nut on the left of the instrument is provided for resetting

it at any time before the maximum count.—The Bristol Co., Waterbury, Conn.

Banbury Laboratory Mixer

Rubber chemists will doubtless find the Banbury laboratory mixer here pictured a very desirable piece of apparatus for experimental mixes and for forecasting results with the various sizes of Banbury mixers used in production. It is also useful for mixing batches with a view to cheapening formulas, improving quality, masticating crude rubber for determining its plasticity, etc.

The laboratory Banbury takes a four-pound batch of crude rubber and approximately 6 pounds of 1.50 gravity mixed stock. The driving power required is 7½ h.p. Floor space required 3½ feet square. The height of the machine is 3 feet. The principle of the mixer is the same as the large sizes but simplified to adapt it to laboratory use. It has two cast steel, water-cooled rotors, and the jackets are also water-cooled. The hopper has been eliminated to reduce the height. The material is charged directly into the body of the machine. Instead of the air or hydraulically operated door moving lengthwise, which is common to all the



Banbury Laboratory Mixer

larger machines, this small mixer has a swinging door, one whole water jacket opening outward to discharge the batch. The gearing is all cut and enclosed in sheet steel guards. A non-recording liquid thermometer is furnished with the machine. The mixer is mounted on a cast iron bedplate, which carries the motor, making a compact, self-contained unit.—Farrel-Birmingham Co., Derby, Conn.

Rubber Cement Jars and Pots

Two convenient containers for holding rubber cement with brushes ready for use are represented in the illustrations. One shows an air-tight screw top glass jar with adjustable brush which can be quickly adjusted up and down to any desired depth in the rubber cement. This container is very simple, clean and convenient to use, preventing the rubber solvent evaporating and the brush from being clogged with dry rubber. The jars come in ¼, ½ and 1-pint capacities.

The other container, a cast-iron pot for bench work, is suffi-

ciently heavy to stay where set without being attached. The base has two studs provided with thumb nuts for drawing down the detachable top air tight. It is not necessary to screw off the thumb nuts to open the pot. Only a few turns are necessary to open and close it, as the cover lugs are provided with slots.

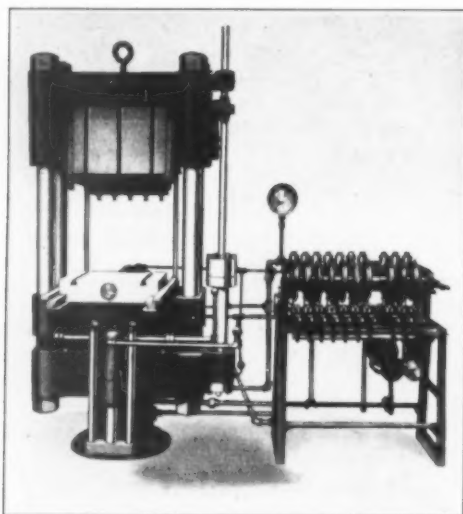


DESK JAR BENCH POT
Rubber Cement Containers

The pot is airtight when closed. In the picture it is represented as cut away to show the inside of the pot.—Favor, Ruhl & Co., distributors, New York, Boston and Chicago.

Automatic Molding Press

A revolving head press with automatic control and used for hot molding plastic compositions is here pictured. The press head and table move out of their pressing position so that the die cavities may be easily cleaned and the molding blanks inserted.



H.P.M. Revolving Head Molding Press

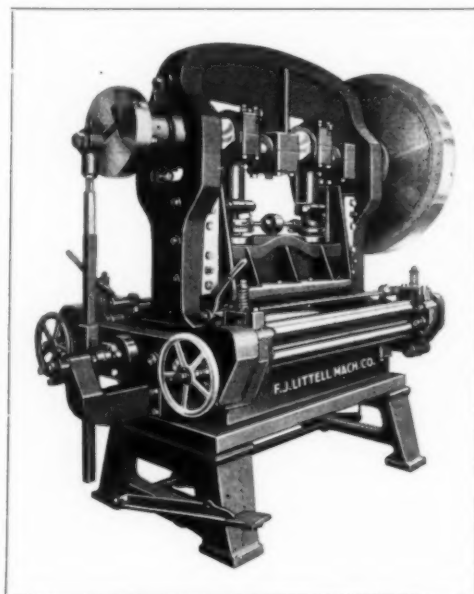
The head carrying the upper half of the mold revolves forward through about 90 degrees. The table, mounted on the moving platen and carrying the lower mold, slides forward. The head and table are each moved in and out of pressing position by separate auxiliary hydraulic cylinders. Particular provision is made to insure accurate alinement of the upper and lower dies.

Both head and table are equipped with knockout mechanism for actuating ejecting pins in either half of the mold. These function each time the press opens. A pair of auxiliary rams open the press at the end of each pressing by aiding gravity in returning the main ram and platen to the lower initial position. Every action is automatically controlled and timed by the mechanism appearing to the right of the press.—The Hydraulic Press Mfg. Co., Columbus, O.

Automatic Roll Feed Punch Press

Manufacturers of molded rubber articles for which mold blanks are stamped out by a cutting press, will be interested in the press here pictured. It shows the newest feed developed for cutting press work. It is a double rack and pinion feed, designed for a double crank press. The feed rolls are four inches in diameter and as wide as the press, which is 44 inches in this instance.

This feed takes material varying in thickness from 0 to 1 inch, and was designed to feed rubber of varying thickness. It also takes metal of uniform or varying thickness, and handles it equally well. The rolls, both in front and behind, can be swung out of the way to put in the die. The feed itself is very rigid



Littell Double Crank Press and Roller Feed

and powerful, and all driving parts are made of hardened and ground tool steel.

The roller drive feeds from 0 to 10 inches very accurately. It has a roller drive hand wheel, which does not revolve when the feed is running, but can be used to feed stock forward. This insures accuracy. There are also a hand lifter and an automatic lifter. The feed can be made to fit any type or make of double crank punch press. It is especially suitable for blanking rubber parts.—F. J. Littell Machine Co., Chicago, Ill.

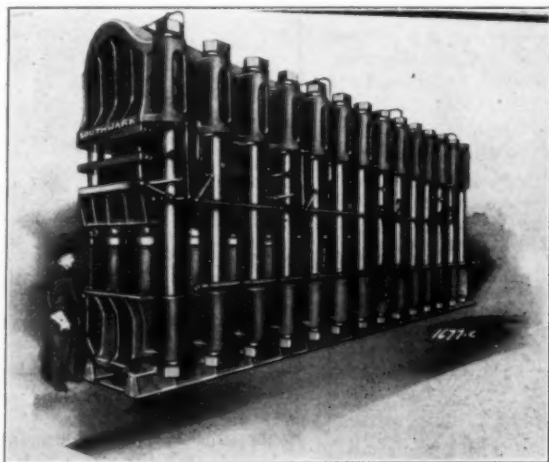
Rubber Tile Press

Very heavy pressure is essential for the proper consolidation of rubber tiling while curing. One of the latest developments in steel platen hydraulic presses for this purpose is here pictured. Rolled steel platens are preferred for use in hydraulic curing presses over cast iron platens regardless of size. They afford lighter weight, greater strength, quicker heating and cooling, perfect drainage and an increase in press capacity together with

accuracy in alinement, thus making possible a better and more uniform product.

The 6,000 ton press is of unusually large size, fitted with three steel plates, 4 feet 8 inches wide by 32 feet long and having highly polished surfaces. The steam passages are drilled through the solid metal and connected in the best way to secure the most efficient circulation of steam and give perfect drainage.

This press has twenty-eight hydraulic cylinders arranged in fourteen units of two cylinders each, mounted on a bed plate which extends the entire length of the press. The total capacity is 6,000 tons, which gives a surface pressure on the platens of 560 pounds per square inch. It is used in the manufacture of rubber or com-



Southwark 6,000-Ton Tile Press

position tiling, matting, belting, etc. This press is one of those durable pieces of machine equipment which never becomes out-worn, although worked at capacity production continuously.—Southwark Foundry & Machine Co., Philadelphia, Pa.

Disk Grinder

A most convenient portable motor operated disk grinder is here pictured. This tool is adapted for a great variety of work



Van Dorn Flex-Disk Grinder

diameter abrasive disks.

The flexible disk feature is emphasized as permitting grinding or sanding operations on curved surfaces. A smaller flexible rubber pad, 6 inches in diameter, is also available for use with the machine. When the 9 1/4-inch abrasive disks become worn they may be cut down for use on the 6-inch flexible pad.—The Van Dorn Electric Tool Co., Cleveland, O.

MOTOR VEHICLE REGISTRATION IN THE UNITED STATES DURING 1927 totaled 23,127,315 passenger cars and trucks.

The Efficient Latex Preservative

Ammonia, despite claims made for other chemicals inhibiting decomposition, is long likely to be the most generally used preservative of rubber latex. It is obviously efficient since it requires but about .5 gram per 100 cubic centimeters of 30 per cent latex to give optimum stability and to fend off harmful serum changes; it is harmless and comparatively cheap, and it has the advantage of being easily dissipated on the conversion of the latex to a dry condition.

Claims Serums Hinder Milling

Answering a question put at a recent conference of British rubber men as to why latex sprayed rubber was more stubborn in milling, Dr. Philip Schidrowitz said that the reason why it was harder to work than ordinary smoked sheet was not, as some believed, that it collected other materials but that it retained a much larger percentage of serum substances than ordinary coagulated rubber and which cannot yet be economically removed.

Bremen Flier Sticks to His Boots

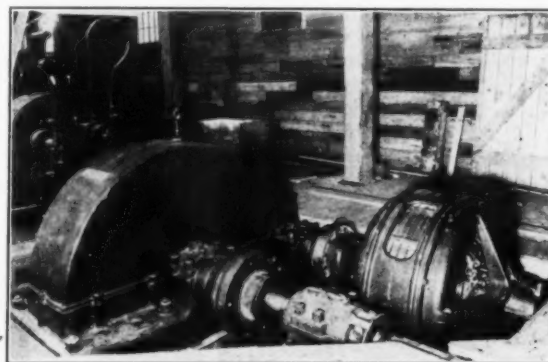
An amusing aftermath to the amazing flight of the Bremen fliers was Major Fitzmaurice's inability to cast aside his rubber hip boots, which he wore continuously for eighteen days. As his wardrobe was carried on his back and the enthusiastic plans of Canada and the United States allowed for nothing so prosaic as a shopping expedition, he had perforce to wait until he had been officially welcomed by both governments before supplying himself with shoes and puttees. It would be interesting to get the Major's opinion of rubber boots.

Forecast 1,200-Pound Acre Yields

The Central Rubber Station at Buitenzorg, Java, notes that the latex yield per tree on some well managed Dutch rubber estates has in a few years increased from 6 to 20 grams daily; and the dry rubber yield per acre, which but a short time ago averaged scarcely 350 pounds, has been so steadily increasing as to justify the prediction that in the very near future acre production of 1,200 pounds will be no unusual output.

Airplane Show

That interest has been thoroughly aroused in all things pertaining to aerial matters has been demonstrated by the very large attendance to the All-American Aircraft Show which was held in Detroit recently. Approximately 150,000 admissions were totaled and forty different cities sent newspaper correspondents to chronicle the events.



ATT-12-400 HP-8 PF-600 RPM-440V-3 PHASE-60 CYCLE SYNCHRONOUS GENERAL ELECTRIC MOTOR, GEARED TO MILL LINE, IN THE PLANT OF PEQUANOC RUBBER CO., BUTLER, N. J.

New Goods and Specialties

Colorful and Up-to-Date Costumes for the Beach



Chic Sport Hat

Once again the season for smart and colorful bathing wear is here, and soon beaches and pools will be crowded with fair bathers disporting themselves in the newest and swankiest accessories devised by enterprising manufacturers.

The chic sport hat shown above is being marketed by The Omo Mfg. Co., 232 Madison Ave., New York City. It is made in solid white with colored bands and reinforced seams. The same company makes the play ball, Kiddies' Delight, with its attractive printed design in various colors.

British manufacturers are showing some very natty models of footwear for beach use, none smarter than the line from J. G. Franklin & Sons, 11-17 Colvestone Crescent, London, E. 8, England. Made in colors to harmonize with the bathing costume, they still retain their original purpose of usefulness and comfort.

The newest models from that clever inventor and designer of rubber novelties, Lady Edison, will cause many a feminine heart to yearn for vacation days and many



Franklin Beach Shoes

a masculine purse to realize that they are approaching.

The model shown is wearing a picture hat of rubberized silk in a light tan color of Dresden design. When the silk cords on either side are drawn, the wide brim folds up and the soft silk crown, together with the lining, forms a suitable bag for the bathing accessories. The coat matches the hat and is artistically trimmed with many little ruches of self material.

The horseshoe swimming ring is made of glossy finish rubberized material, the sections being red, white and blue. A distinguishing feature is that it may be tied to



New Designs from Lady Edison



U. S. Bathing Shoe

fit either a child or an adult. The ball resembles a pin wheel and is made up in varied colors. An attractive feature is a bell, inside the ball, which jingles whenever the ball is handled or thrown.

The manufacturer of these Lady Edison novelties is E. A. Guinzburg, 245 Fifth Ave., New York, N. Y.

The United States Rubber Co., 1790 Broadway, New York, N. Y., has added a bathing shoe of trim and dainty appearance. The colors and patterns closely follow the style of leather shoes, and conform



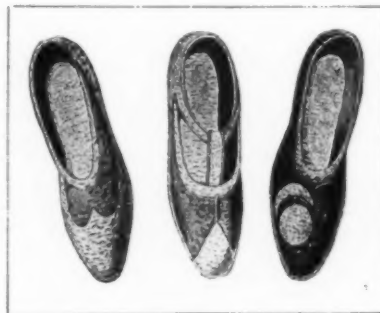
Reliance Casque Cap

to the popular shades of the day.

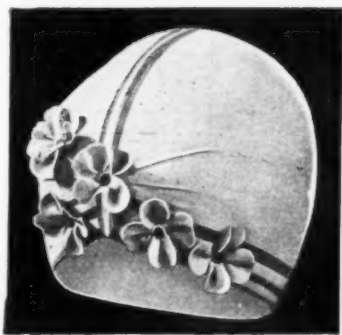
A wide selection of seamless, molded caps is offered by the Reliance Rubber Co., Ltd., Formosa St. and Amberley Rd., Paddington, London, W. 9, England. Many of these caps are made in the fashionable casque model so popular in millinery today, and striking shades of gold, silver and bronze luster have been added to the standard colors usually carried.

The Felstead beach, bathroom or tennis shoe is made of specially prepared crepe rubber, insuring great strength and wear resisting properties to the finished product.

Artistic and novel designs form a pleasing and smart foot covering extremely comfortable to wear. Combinations of colors, trimmed with flowers or other raised decorations, fancy lattice straps and specially strengthened toes and heels are supplied. The manufacturer is J. G. Ingram & Son, Ltd., Hackney Wick, London, E. 9, England.



Felstead Beach Shoes



Cap with Flower Ornaments

The Miller Rubber Co., Akron, O., has a wide variety in bathing caps suitable to every taste. Plain or fancy, these snug fitting caps protect the hair from water and give the greatest service. Colors and combinations are offered from the more quiet shades of dark blue, green and purple with little or no trim—to the gorgeous array of brilliant bizarre effects to harmonize with the most dashing beach ensemble.

The three flowered caps from the above company, shown in the



Drypac

illustrations, are designed to please the eye without detracting from the utilitarian purpose of the cap. Contrasting colors are effective and artistic.

Belts in satin finish are made of tough fabric, covered and impregnated with rubber and are reversible. Buckles are satin finish, nickel plated and rust proof. The water flowers and ornaments give the

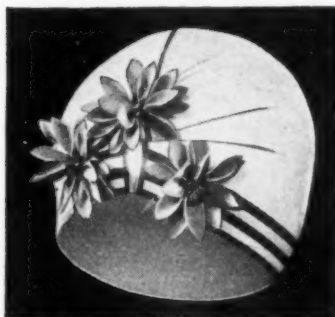


Kiddies' Delight

style and color so important today.

Beach balls, by the same manufacturer, provide fun for grown-ups as well as children, all strongly made of high grade rubber.

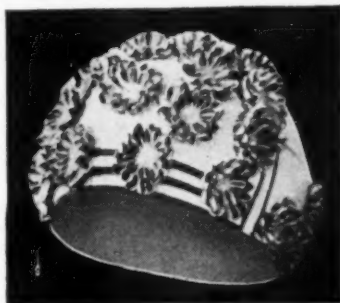
Drypac, a watertight pocket for the bathing suit is a product of The Drypac Mfg. Co., Stratford, Conn. In it eiga-



Dainty Flower Trimming



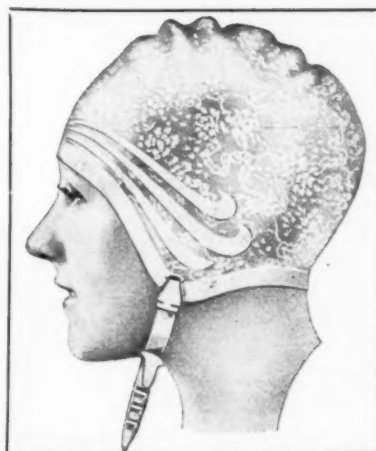
A Beach Pirate



Flowered Cap

rettes, matches, handkerchief and money may be safely carried and powder compact and candy stowed away in case of emergency.

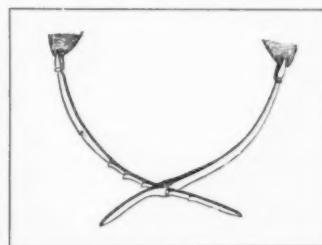
The most popular model marketed by The Faultless Rubber Co., Ashland, O., is shown in the picture and follows the style most approved by bathers as evidenced by



Faultless' Popular Cap

the great number in use. Close fitting and snug, the combination of colors makes it extremely becoming and harmonious to the hue of the bathing suit.

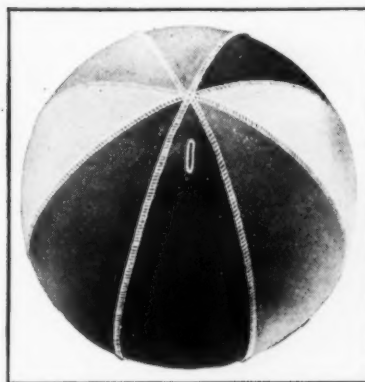
The chin strap, also a Faultless product, has been newly designed, patented and offered to the trade this year. As its name, Zip, suggests it as-



Zip Chin Strap

sure a snug fit, holding the cap secure and so protects the hair from the water.

A beach ball, which has been receiving favorable comment, is made by the Collette Mfg. Co., Amsterdam, N. Y. It is of excellent quality, made to sell at a reasonable price, in colors to appeal to the eye. These balls are popular at the beaches and are used in the water or on the sand.



Collette Beach Ball

Financial and Corporate News

New Incorporations

NAT. E. BERZEN, INC., April 25 (New York), capital stock 1,000 shares pfd. par value \$100 and 1,000 shares com. no par value. N. E. Berzen, president and treasurer; L. Friedlander, vice-president; J. Lieben, assistant secretary, all of 232-3 South St., New York, N. Y., M. Friedlander, secretary, 627 W. Market St., Akron, O. Principal office, 232-3 South St., New York, N. Y. To deal in scrap and crude rubber.

JOSEPH CHALFIN, INC., April 3 (New York), capital stock 200 shares no par value. J. Chalfin, 80 Washington St., F. Chalfin, 1485 Fulton Ave., Bronx, M. Kelly, 512 West 180th St., all of New York, N. Y. Principal office, New York, N. Y. General scrap rubber business.

DAYTON TIRE CO. OF NEW JERSEY, INC., March 30 (New Jersey) Capital stock \$125,000. D. Stern, 361 Fair St., J. Stern, 347 E. 39th St., both of Paterson, B. Hubert, 130 Linden St., Jersey City, both in N. J. Principal office, Sanford Place, Jersey City, N. J. To manufacture and deal in tires etc.

FREEMPT H. & M. TIRE SHOP, INC., March 6 (Illinois), \$20,000. C. R. Mellin, president, E. Mellin, secretary and treasurer, both of 122 N. Grove Ave., H. Jacobs, vice president, 615 W. Ordway St., both of Freeport, Ill. Principal office, 122 N. Chicago Ave., Freeport, Ill. To manufacture and deal in tires.

NO SLIP RUBBER CORP., May 12 (New York), \$10,000. S. Weiss, 500 Fifth Ave., W. F. Shepard, 51 Charles St., V. R. Hiseock, 40-57 75th St., Jackson Heights, all of New York, N. Y. Principal office, Manhattan. To manufacture rubber and other products.

PEACHY RAINCOATS, INC., April 12 (New York), capital stock 100 shares no par value. R. Wallach, president and treasurer, H. Replogle, vice president, H. Linge, secretary. Principal office, Manhattan. To import and sell waterproof garments.

R. C. RUBBER CO. OF NEW YORK, INC., April 12 (New York), \$100,000. R. Glenndinning and G. Rishell both of 364 West 23rd St., J. Levy, 37-60 98th St., Corona, L. I., both of New York, N. Y. Principal office, Manhattan. To manufacture tires and rubber goods of all kinds.

ROOT TRUCK TIRE CORP., April 26 (New York), \$3,000. E. S. and R. L. Root, both of 215 Martense St., Brooklyn, M. E. Canarie, 721 Melrose Ave., New York, both in N. Y. Principal office, Bronx County, New York, N. Y. To manufacture and deal in tires.

Akron Rubber Stock Quotations

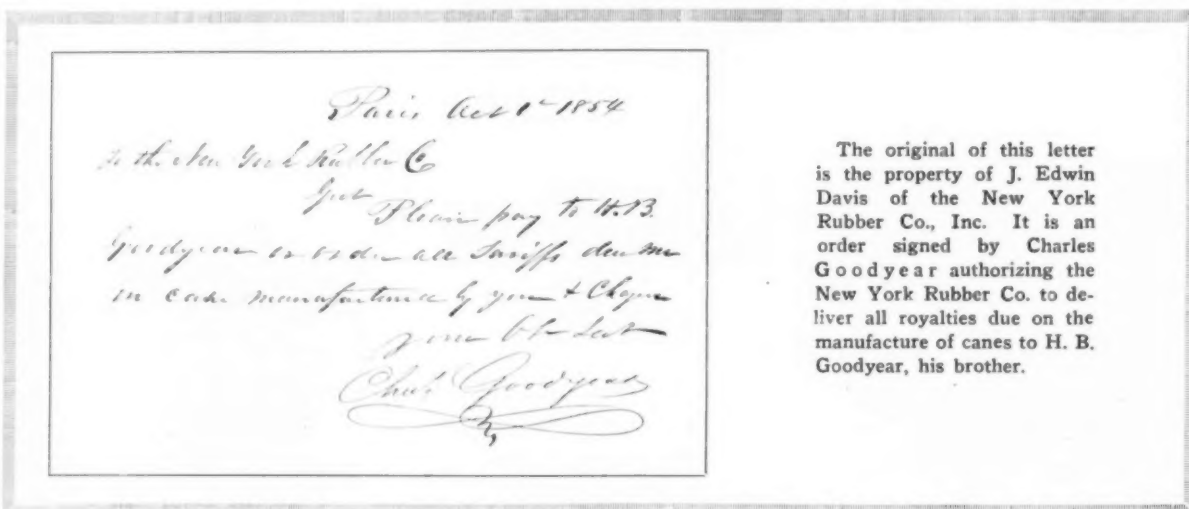
May 21, 1928		Bid	Asked
Company			
Akron Rubber Reclaim.....		18	22
Akron Rubber Reclaim, pfd.....			99
Falls		10	11½
Faultless			36
Firestone		175	180
Firestone, 6% pfd.....		110	110½
Firestone, 7% pfd.....		109½	109½
General		170	180
General, 6% pfd.....		100	100½
Goodrich		87	88½
Goodrich, pfd.....		114½	115½
Goodrich, 6½s		107½	108
Goodyear		51½	52½
Goodyear, 1st pfd.....		95½	96½
Goodyear, 5s 28.....		99½	100½
Goodyear, 5s 57.....		92½	93
Goodyear, 5½s 31.....		100½	101
India		41½	43½
India, 7% pfd.....		84	
Mason		½	1½
Mason, pfd.....		6	12
Miller		19½	20½
Miller, 8% pfd.....		71	
Mohawk		142	155
Mohawk, 7% pfd.....		80	86
Rubber Service			40
Seiberling		45	45½
Seiberling, 8% pfd.....		105	108
Star			1

New York Stock Exchange Quotations

May 22, 1928		High	Low	Last
Company				
Ajax Rubber, com.....		93½	91½	91½
Fisk Rubber, com.....		143½	143½	143½
Goodrich, B. F., com. (4).....		85¾	84½	85¾
Goodrich, B. F., pfd. (7).....		114	114	114
Goodyear		50½	48½	49½
Goodyear Tire & Rubber 1st pfd. (7).....		96½	96½	96½
Intercontinental Rubber (1).....		12	11½	11½
Kelly Springfield Tire, com.....		21	20	20½
Kelly Springfield Tire 6% pfd.....		60	60	60
Lee Rubber & Tire, com.....		21	20	20½
Miller Rubber		20½	20½	20½
Norwalk Tire & Rubber.....		3½	3½	3½
United States Rubber, com.....		41¾	41¾	41¾
United States Rubber, 1st pfd.....		77	76½	76½

Grand Central Palace to Have Permanent Exhibits

It is planned to convert the eight upper floors of the Grand Central Palace to the use of permanent industrial expositions, according to plans now under consideration by Conde Nast, the publisher, and his associates, who have secured control of the building. The four lower floors will still be devoted to the temporary shows, such as the Automobile Show, Electrical Show, etc.



The Rubber Industry in America

Ohio

Activities at Goodyear Plant General Sales Manager Goodrich Rubber Co.

Accidents at the plant of the Goodyear Tire & Rubber Co., Akron, O., have been reduced 26.8 per cent so far this year. In an effort to further reduce the accident toll men of the flying squadron have been instructed to keep an eye on the workers to see who is careless.

Changes in personnel at the plant as announced include the appointment of F. W. Climer as personnel manager; L. A. Hurley, assistant manager of the efficiency division; Leroy Tomkinson, manager of the flying squadrons; and Frank J. Enright, manager of the Goodyear extension university.

Prizes aggregating \$50 will be given for the three most beautiful gardens under plans for a best garden contest made public by the Goodyear Employees Activities Committee. First prize is \$25; second, \$15; and third, \$10.

Robert S. Pope returned to Akron to become secretary to President P. W. Litchfield. Pope has been connected with the general superintendent's office at Los Angeles for a number of years, and formerly served as secretary to W. C. State in the engineering department of the Akron factory.

Employees are all busy on plans for the big picnic which will be held July 21, at Meyers Lake Park, Canton. All Goodyearites who have cars will be expected to give the others a lift, parking space for thousands of automobiles having been reserved. Two airplanes will escort the workers to the park and a parade will be held through the streets.

O'Neil Gives Radio Talk

An interesting talk was given by William O'Neil, president of the General Tire & Rubber Co., Akron, O., from Station WRNY, on Sunday, May 6.

Mr. O'Neil spoke under the direction of the Industrial Digest Magazine, in connection with the series "Little Journeys into Big Industries." He presented in a very entertaining way the manner in which the weird religious practices of the Malay archipelago affects the price of American automobile tires, and gave many interesting sidelights on the romantic history of the rubber industry.

An illuminating comparison was made between the superstitious Malaysians, who are content to work for a pittance of twenty cents a day, and their more enlightened brothers in the Philippines and neighboring islands who demand much higher wages with which to supply the luxuries introduced to them by Christian missionaries.

Clarence Edwards Cook was born April 10, 1880, at Cleveland, O. His education was received in the schools of his home town, where he attended the grammar and



Blank-Stoller, Inc.

C. E. Cook

Central High School, afterwards completing a course at the Berkey & Dykes Business College.

He first became connected with the rubber industry in 1898 as a clerk for The B. F. Goodrich Co. where he remained until 1901, when he associated himself with the People's Hard Rubber Co. In 1902 he joined the forces of the Gutta Percha & Rubber Mfg. Co. as salesman. He remained with the latter company until 1905, when he joined the sales organization of The B. F. Goodrich Rubber Co., with which he is at present identified.

Close application to work and a conscientious regard for detail, have distinguished Mr. Cook's work with the Goodrich company which has, by steady

advancement and promotion, shown a recognition of his worth and value to the company. He joined the organization as a salesman and in 1911 was made Pacific Coast manager, with headquarters in San Francisco. In 1917 he returned to Akron to assume the position of manager of branch operations. In 1919 he was appointed manager of mechanical, footwear and sundries' sales, which appointment he still holds. He was elected a director of the corporation in 1926.

Mr. Cook is a 32nd degree Mason, Knight Templar, and is a member of Tad Moor Shrine.

Assistant to Goodyear's President

Harry E. Blythe has been made assistant to P. W. Litchfield, president of The Goodyear Tire & Rubber Co., and will be in charge of personnel and special sales problems. Blythe's first position with the company was in the sales organization, afterwards being made manager of the Denver branch, and later district sales manager. In 1921 he was appointed general superintendent of the California plant at Los Angeles, which position he held at the time of his present assignment.

John Diehl, general sales manager and vice president of the Mason Tire & Rubber Co., Kent, O., has resigned as head of the sales department. According to press reports, William A. Cluff, president, has declared that no appointment will be made to fill the vacancy of the resigned vice president.

The New Jersey Zinc Sales Co. announces the appointment of P. P. Tillinghast as district sales manager with offices at the Guardian Bldg., Cleveland, O. Mr. Tillinghast has been associated with the company since 1903, and, until his present appointment, was its foreign representative, with headquarters in London.

The Tire & Rim Association of America, 1401 Guarantee Title Bldg., Cleveland, O., has elected Burgess Darrow, of the Goodyear Tire & Rubber Co., president. C. C. Carlton was made vice president; C. E. Bonnett, secretary, and H. W. Kranz, treasurer.

W. P. Naismith, president of the India Tyre & Rubber Co., Great Britain, Ltd., spent several days at the plant of the India Tyre & Rubber Co., Akron, O., conferring on the opening of the new British plant, which will take place about June 1. Mr. Naismith reports sales on India tires are very good throughout Britain and looks for a bright future for the new plant.

T. W. Morris, 6312 Winthrop Ave., Chicago, Ill., manufacturer of trimming machines, was in Akron, O., recently calling on the rubber trade.

Firestone Tire & Rubber Co., Akron, O., has contracted to equip with pneumatic tires all the buses of the Los Angeles Street Railway Co., winning the award, it is stated, solely on a mileage test.

John F. Malley, grand exalted ruler of the Order of Elks, was a special guest of honor of the Akron Elks on May 19. C. W. Seiberling, vice president of the Seiberling Rubber Co., acted as toastmaster at the dinner and program of addresses, introducing Mr. Malley and the other speakers.

The B. F. Goodrich Co. entertained members of the Akron Lions with special motion pictures showing the working of the plant. The views were taken in the laboratory and various departments where articles such as fire hose, belting, sheeting and other standardized products are made.

The U. S. Chamber of Commerce meeting, which was held in Washington, D. C., May 7 to 11, was attended by seven delegates from Akron which included P. W. Litchfield, president of the Goodyear Tire & Rubber Co.; G. R. Lamson, Firestone Tire & Rubber Co.; and T. B. Tompkinson, B. F. Goodrich Co.

Leslie Marshall, of the Firestone Tire & Rubber Co.'s publicity department, was hurt in an automobile accident and his left hand severely injured.

Mr. & Mrs. Harvey S. Firestone, Jr., of Akron, O., returned to New York on the Liner Majestic from Liberia where they have been spending the last eight weeks at the rubber plantations of the Firestone company. Harvey S. Firestone, Sr., went to New York to welcome them home.

F. A. Seiberling, president of the Seiberling Rubber Co., Akron, O., spoke at the fifth annual convention of the National Association of Foremen held in Canton, O., May 25 and 26. He chose as his subject "The Requisites of the Foremen of Tomorrow."

The Associated Press Editors who were visiting in Akron were invited on a trip in the Goodyear blimp "Pilgrim" and on a tour of the Goodyear factory. Many availed themselves of both invitations.

The Mohawk Rubber Co., Akron, O., employees held a smoker on May 26 at the Knights of Columbus auditorium. An entertaining program was arranged which included short bouts by local boxers and several vaudeville acts.

The Ault & Wiborg Co., at Cincinnati, O., it is reported, has been acquired by Dillon, Read & Co. The organization is one of the largest producers of printing inks and varnishes and was established in 1878 by L. A. Ault, who is its president. It is said that Dillon & Read plan to form an international combination of this and other companies in the same field, and that the new company's capital stock will be in the neighborhood of \$14,000,000.

The Lancaster Tire & Rubber Co., Columbus, O., was sold at private sale May 7 to the General Parts Corp., Detroit, Mich. It is reported that the latter company has disposed of that part of the factory devoted to rubber heels and soles and that production of these articles will be continued as heretofore.

Praise to Firestone for Work in Liberia

The achievements of the Firestone Tire & Rubber Co. in Liberia were spoken of in glowing terms at the quadrennial session of the Methodist general conference which was held at Kansas City, Mo.

Bishop Johnson, who spent the past twelve years in that country, spoke of

the improvements in the living conditions of the natives since the coming of Firestone, and was warm in his praise of the civilizing influence which the company has had on the black man. He described the native as eager and quick to learn and take advantage of the opportunities offered him.

New Jersey

Tires and tubes are now leading in the manufacture of rubber goods in the New Jersey plants. All tire factories report a large increase in orders from various sections of the country and look forward to a busy summer season. Balloons are leading over the cord tires in production. Some of the mechanical products have dropped off a little, while others remain at normal. Factories producing hard rubber report orders on the increase. Rubber reclaiming plants are also busy.

The Rubber Manufacturers' Association of New Jersey has made elaborate plans for its summer meeting and entertainment to be held June 18 at the Trenton Country Club. Following a dinner the remainder of the day will be devoted to golf. The members of the mechanical goods division will be the guests of the association. The meeting will be the last one of the season.

The Murray Rubber Co., Trenton, N. J., announces that Dr. Edward H. Grafton, chief chemist, has resigned and that his successor is Warren F. Jones. A. N. Alexander, comptroller and director of the mechanical sales division for many years, has also resigned, and Randolph Wert has been appointed comptroller. Howard M. Stoner and B. M. Callen have been placed in charge of the mechanical sales division.

The Essex Rubber Co., Trenton, N. J., announces the appointment of George T. Oakley as manager of the mechanical goods department of that concern to succeed Edmund L. Stimson, who died a short time ago.

The Joseph Stokes Rubber Co., Trenton, N. J., reports business increasing with enough orders to insure a good summer output. The Canadian plant at Welland, Ont., is also very busy on hard rubber goods.

The Pocono Rubber Cloth Co., Trenton, N. J., recently entertained the company's basketball team of that concern at a banquet at the Hotel Sterling. Holland B. Slusser, vice president of the company, was the toastmaster.

The Murray Rubber Co., Trenton, N. J., recently had a rubber flooring display at the Architects & Builders' Exhibition at Trenton. The company's output is purchased principally by schools, colleges, hospitals, banks and business houses.

The Combination Rubber Co., Trenton, N. J., announces a big improvement in tire and tube output during the past month. Several new accounts have been opened.

Charles E. Stokes, Sr., president of the Home Rubber Co., Trenton, N. J., and Mrs. Stokes have returned from a trip to Chicago, Ill.

The Pierce-Roberts Rubber Co., Trenton, N. J., reports business largely increased over last month and the factory operating with two shifts on mechanical rubber goods. The company has begun the erection of a plant addition.

Whitehead Brothers Rubber Co., Trenton, N. J., has secured permission from the Mercer County Freeholders for the laying of a railroad track along Whitehead's road to be used for shipping purposes.

The Luzerne Rubber Co., Trenton, N. J., states that business is showing some improvement.

The Puritan Rubber Mfg. Co., Trenton, N. J., manufacturer of Amtico marbled rubber tile and tile cement, has increased its buildings and equipment to take care of the demand for its products. The company is operating on day and night schedule, and has been doing so for the past three or four years.

The Fisk Flap Tube Rubber Co.'s plant, Yardville, N. J., which has been idle since the death, last December, of its president and founder, C. Francis Fisk, is expected to resume operations in the near future. The company charter has been revised and the name changed to Fidelity Industrial Corp. Officers are: F. F. Blaisdell, president; Harvey Shomo, vice president; J. F. Axtell, secretary; and F. A. Wear, treasurer. The company manufactures a patented automobile inner tube with flap attached and which will be marketed under the name of the Fisk Bonded Tube.

John B. Tuttle has charge of the sales to the rubber industry of oils and grease for the Woburn Degreasing Co., with headquarters at the Harrison, N. J., plant. The company is preparing special blends of its own and other oils suitable for use in special compounds or other purposes.

New England

The Fisk Rubber Co.'s production is at a record level averaging 35,000 tires per day. The company's plant at Chicopee Falls, Mass., is producing 20,000 units daily and the plant at Cudahy, Wis., is turning out 15,000. The unit output for the first quarter was 15 per cent ahead of the corresponding quarter in 1927. The company's inventory position is considered satisfactory, the number of finished units on hand being 20 per cent below last year.

The Ellis Tire & Rubber Co. on May 21st opened an additional store at 685 Beacon St., Boston. The new store, the fourth in the chain now maintained by this company, will serve as headquarters for the organization. An experienced staff, complete equipment and every modern convenience combined with spacious quarters will enable the company to render efficient tire and rim service.

The Massachusetts Department of Labor and Industries reports a decrease of 15.3 per cent in the payroll of the Massachusetts footwear industry for the past month. Seasonal conditions were declared responsible for this decrease.

The American Rubber Co., Cambridge, Mass., a subsidiary of the United States Rubber Co., recently joined the Cambridge Industrial Association.

Hood Rubber Co., Watertown, Mass., reports that H. F. Stose has left the development department where he has been for four years, and is now with the Victor Talking Machine Co., Camden, N. J. Mr. Stose's new work will be on chemical engineering problems in the engineering and development department.

Dr. P. Klein, coinventor of the anode process and president of the Hungarian

Rubber Goods Factory, Ltd., Budapest, manufacturer of mechanicals, tires and electro-deposited rubber goods, was a recent visitor at several greater Boston rubber companies.

The Firestone Tire & Rubber Co.'s textile mills at New Bedford, Mass., recently went on a day and night schedule which will be adhered to until further notice. The textile strike which directly affected 27,000 operatives and tied up 51,000 looms has not affected those mills producing tire fabrics.

The Collyer Insulated Wire Co., Pawtucket, R. I., plans the erection of a three-story addition to its present plant. The proposed new building will be 80 by 105 feet and is estimated to cost about \$100,000 with complete equipment.

The Ludlow Mfg. Associates, with plants at Ludlow, Mass., and at Calcutta, India, makers of burlap and sacking for the rubber trade, have purchased the properties of the Southeastern Mfg. Co., Savanna, Ga. The company will be reorganized under the name of the Ludlow Gorgia Bagging Co.

U. S. Automobile Production

April production (factory sales) of motor vehicles in the United States, as reported to the Department of Commerce, was 409,948, of which 364,877 were passenger cars and 45,071 were trucks, as compared with 413,379 passenger cars and trucks in March and 404,759 in April, 1927.

ACCORDING TO A RULING RECENTLY MADE by Attorney-General John R. Saunders, a rubber stamp may be used to write on a ballot the name of a candidate which is not printed thereon.

Authority on the Cultivation Of Rubber

John Warren Bicknell, a leading American authority on rubber cultivation, was born at Malden, Mass., December 5, 1886. After a preparatory course at Oxford School, Malden, he entered Harvard University, from which he was graduated in 1909.

Following six months' service with C. D. Parker & Co., Boston, he entered the employ of the United States Rubber



J. W. Bicknell

Co., December, 1910, with which corporation he has remained ever since that time.

He gained a varied acquaintance with trade needs while with the subsidiary General Rubber Co., and when the United States Rubber Plantations, Inc., was formed he was assigned to an important position in the management of the new subsidiary concern. About ten years of his service was spent in Sumatra on the company's plantations and in other parts of the Far East rubber regions.

That his work has been valuable is best indicated by the fact that he is now vice president and managing director of the company's plantations in the Far East with executive headquarters at Medan, Sumatra.

At the Rubber Division symposium held on September 9-10, 1926, in connection with the 72nd general meeting of the American Chemical Society in Philadelphia, Mr. Bicknell read a very informative paper on "Botanical and Chemical Development in the Plantation Industry." He is a member of the Harvard and Lotos Clubs of New York City and other societies.

A.S.T.M. Annual Meeting

The thirty-first annual meeting of the American Society for Testing Materials will be held June 25-29 at Chalfonte-Haddon Hall, Atlantic City, N. J. No sessions for the annual meeting have been scheduled for the opening day, Monday, June 25, that day having been reserved for committee meetings and registration. The General Opening Session will be held Tuesday afternoon at 2 o'clock. Immediately following this two simultaneous technical sessions will be convened at 3 o'clock.



The rubber products plant of the du Pont company at Fairfield, Connecticut. It was established more than forty-five years ago by the Fairfield Rubber Co., then the leader in the carriage cloth field.

Eastern and Southern

Henry R. Gilson, technical assistant to the president of the United States Rubber Co., is on the council of the American Institute of Weights and Measures, 115 Broadway, New York, N. Y.

V. G. Thomas & Co., 99 John St., New York, N. Y., is the agent for The Derby-Oxide & Colour Co., Ltd., Rugeley, Staffs, England, maker of oxide of iron colors.

The Republic Rubber Co., Youngstown, O., announces the location of its New York sales office, mechanical division, at 11 Park Place.

The Smith Chemical & Color Co., 28 Moore street, New York, N. Y., has appointed B. Stadholz as its representative in the eastern territory. Mr. Stadholz is now calling on the rubber trade with the Smithko brand of chemically produced and highly concentrated dry colors, earth colors, pigment fillers and other specially prepared raw materials.

Arthur Gottehrer, crude rubber broker, doing business under the name of the New York Rubber Brokerage Co., has moved his offices to 27-29 Beaver St., New York, N. Y.

The B. F. Goodrich Rubber Co. has removed its New York office to 33 West 60th St.

Nat E. Berzen, Inc., has been formed with offices at 232-233 South St., New York, N. Y. Mr. Berzen has been in the scrap business for the past twenty-five years and the corporation will continue dealing in all grades of scrap as well as crude rubber and other kinds of waste material.

The Peachey Raincoats, Inc., 347 Madison Ave., New York, N. Y., has been organized to import and sell waterproof garments manufactured by the Peachey Textiles, Ltd., London, England, under the patented process of the Peachey Process Co.

Rutherford Heads Pennsylvania Company

At a meeting of the Board of Directors of the Pennsylvania Rubber Co., Jeannette, Pa., held on May 17, W. O. Rutherford was elected president. Mr. Rutherford was identified with The B. F. Goodrich Co. for twenty-six years, holding various positions in the sales division, finally being elected vice president and director in which capacity he guided the sales activities.

He has long been a leading figure in the rubber industry, serving as president and director of the Rubber Association of America for three terms; president and director of the Motor & Accessory Mfgs. Association; director of the Lincoln Highway; and as a member of the Pan-American Highway Education Board.

The New Jersey Zinc Sales Co. has appointed Bruce R. Silver manager of sales development at the New York headquarters of the company. Mr. Silver joined the organization's forces in 1922 and is widely known to the rubber trade.

Harry Hoag

Convalescing

L. H. Hoag, advertising manager of INDIA RUBBER WORLD, who has been confined to the hospital for some little time, is now in the convalescent stage.

His many friends in the trade will be glad to know that at the present rate of improvement, he will be able to resume his duties within the next few weeks.

H. Lawton Pettingell has been made eastern division manager, with headquarters at New York, for Lee of Conshohocken.

John P. Hubbell, until May 1 assistant chief of research of the New Jersey Zinc Co., has become a partner in the firm of Singmaster & Breyer, chemical engineers and metallurgists, 420 Lexington Ave., New York, N. Y. Mr. Hubbell is a graduate of Williams College and Columbia University. Prior to his nine years' connection with the New Jersey Zinc Co. he was with the General Chemical Co. and in the Gas Defence of the U. S. Army.

Karl W. Van Nix, now associated with R. S. Hardy Co., 44 Broad St., New York, N. Y., dealer in crude rubber and balata, was formerly assistant purchasing agent for Lee Tire & Rubber Co., Conshohocken, Pa. He lately returned from a trip to the Far East visiting Singapore, Dutch East Indies and Philippine Islands.

R. B. Tracy, eastern sales manager for the Henderson Tire & Rubber Co. for the past five years, has resigned to accept a position with the Cupples Co., St. Louis, Mo., as Eastern sales manager of the tire division. Mr. Tracy will have his offices at 90 West Broadway, New York, N. Y.

C. Kenyon Co., Brooklyn, N. Y., is operating close to capacity with a tire production in excess of 2,000 daily.

Parker, Stearns & Co., Brooklyn, N. Y., has elected J. Russell Parker to succeed his late father in the presidency of the company. E. Ward Stearns still remains treasurer and Ira K. Chichester has been made secretary.

L. H. Gilmer Co., Tacony, Philadelphia, Pa., is running to capacity, and business is reported as being better than for several years past. The company manufactures automobile fan belts and similar articles. John S. Kraus is president and E. Snyder manager of the rubber department.

The Nagle Machine Co., successor to the Allen Machine Co. of Erie, Pa., announces the opening of a New York office located at 296 Broadway, in charge of Harry J. Smith. This office will be in a position to give customers in the Eastern section competent service on all of its products.

Thomas N. Hendricks has been made manager of the Atlanta, Ga., branch of the India Tire & Rubber Co., Akron, O. George C. Bacon will cover Southern Ohio, Kentucky and parts of Indiana and West Virginia, making his headquarters in Cincinnati.

Lockwood, Greene & Co., Inc., 24 Federal St., Boston, Mass., has three divisions of the New England Southern Mills under its management: Hogansville Mills, Hogansville, Ga., Stark Mills, Hogansville, Ga., and LaGrange Mills, LaGrange, Ga. The Hogansville and LaGrange mills manufacture hose and belting duck, and the Stark Mills, tire yarns and fabric.

McClaren Rubber Co., Charlotte, N. C., is increasing production and operating its plant close to the maximum capacity, according to Charles Collins, general manager. Sales of tires for the first quarter of the year have gone far ahead of all former corresponding totals.

Hand Puller for Plugs



Inserting Tool

The Rubber Plug Co., 2482 East 22nd St., Cleveland, O., manufacturer of Gold Seal Brand tire repair plugs, has added a new hand puller to the service kit offered the trade which facilitates and speeds the inserting of plugs. This handy tool is given to the dealer without extra charge and enables him to do a neat job in a few seconds.

Pacific Coast

Pioneer Rubber Mills of San Francisco is still running three shifts daily in nearly all departments at its works in Pittsburg, Contra Costa county. Heavy and light hose, conveyer belting, and general mechanicals are in strong demand. A recent order is for 20,000 feet of 3½-inch rubber jacketed fire hose for Los Angeles, and for which there was sharp bidding.

Douglas Radford, president of the West American Rubber Co., Los Angeles, and Commodore of the Los Angeles Yacht Club, will be one of the contestants for the Sir Thomas Lipton prize offered for a race of sailing vessels between Newport harbor, south of Los Angeles, to Honolulu, the longest course in the world, 2,250 miles. The journey will be made by Commodore Radford and seven others in a 60-foot yacht and the journey will probably take about two weeks.

Rubber-fitted Streetcars. Three of these have been put in operation on the No. 5 McAllister St. line of the Market St. Ry., San Francisco; and it is stated that if the noise can be much lessened, without marked disadvantages, the company will order twenty-six cars more of the same type. Experiments have been conducted for two years, and so far the practical tests have been encouraging, the usual banging, rattling and thumping being noticeably reduced. The new features include rubber pads between trucks and bolsters and also between body and bolsters, gears deadened with lead, and sound-absorbing material under floors of car bodies, over motors and trucks, and surrounding the air pumps.

Herbert N. Wayne, 514 Alta St., Santa Monica, Calif., veteran inventor and rubber manufacturer, is Pacific Coast representative of L. Albert & Son, used rubber machinery dealer, Trenton, N. J.

Pacific Goodrich Rubber Co., Los Angeles, Calif., has been awarded the contract for supplying the State of California with tires for the ensuing year. In the spirited bidding half a dozen companies doing a national business competed, and discounts offered are said to have ranged from 25 and 5 to 35 and 2 per cent. The volume of business involved is estimated to be \$125,000.

W. R. Wheatly, for many months Los Angeles branch manager of India Tire & Rubber Co., Akron, O., has been promoted to the post of Pacific Coast manager with headquarters at 460 9th St., San Francisco. He succeeds Frank L. Ryan, recently made general sales manager at Akron. C. M. Greenwood, sales executive of the San Francisco branch, has been put in charge of the Los Angeles branch at 837 Traction Ave.

Rex Rubber Co. is now operating a tire rebuilding plant at 1920 E. Vernon Ave., Los Angeles, under management of Arnold Biethan, who conducted the Burton-Wade Rubber Co., and the plant of which at 717 E. 61st St., Los Angeles, was recently destroyed by fire with a loss to Mr. Biethan of about \$25,000.

General Tire & Rubber Co., Akron, O., has not abandoned the idea of establishing a factory on the Pacific Coast, according to Howard Smith, general sales manager, who is making a business trip between San Diego and Seattle, from which place he will return to Akron. He states that increasing sales are hastening the day when such a factory must be built to take care of Far West and trans-Pacific business, and it will be erected much sooner than many expect. Mr. Smith explained that General's sales depend upon users' choice, as the tires are not standard equipment on any car, due to the company's policy of not seeking business from automobile manufacturers.

Firestone California Factory Operating

The first tire will be made late in June in the new factory of the Firestone Tire & Rubber Co. of California at Los Angeles. All the buildings are practically completed; in fact, the general contract has been executed, the engineers in charge state, and all that remains to be done is work of a minor kind. The calenders, presses, and other heavy machinery are all in position, and the power house will be able to furnish steam for the entire plant June 1. The formal opening will take place in July, and an impressive program will be arranged.

Kelly-Springfield Tire Co. has been studying trade in San Francisco, Salt Lake City and Denver through T. S. Lindsey, vice president and sales manager, and George M. Martin, special representative. Pierre E. Myers, manager of the branch at 560 9th St., San Francisco, has been making a business survey in Southern California. G. V. S. Harvey has succeeded C. W. Brown, resigned, as manager of the branch at 484 Gilsan St., Portland, Ore. T. O. Ingledew has succeeded Earl Kaufman as manager of the Phoenix, Arizona, branch, and Philip Carlson takes the place of H. D. Ennis as office manager.

United States Rubber Co. has during the past quarter enjoyed a marked improvement in unit total and value of sales over the preceding three months, according to Pacific Coast Manager J. B. Brady, and the outlook for the remainder of the summer is reported as very encouraging. Mr. Brady and H. B. Chamlee, Pacific Coast manager of mechanical sales, were mid-May guests of Los Angeles Branch Manager J. B. Magee. The staff of the San Diego sub-branch recently moved into the new building erected by the company.

E. S. Swan & Co., 318 Produce Bldg., Los Angeles, Calif., first-hand broker, has been organized by E. S. Swan, Manuel L. Gonzalez and their secretary Fred G. Fernald, formerly comprising the entire staff in the rubber, spice and far eastern departments of I. A. Wood & Co.

Mohawk Rubber Co., Akron, O., may extend its activities on the Pacific Coast considerably in the near future, according to President and General Manager S. S. Miller and Vice President and General Sales Manager J. F. Jones, who made a tour of the leading coast cities during May. Asked if a report were true that the company was planning to build a tire factory in the Southwest, they stated that the report was quite premature. They were well pleased, however, with the company's volume of business in the far west field.

E. M. Smith Co., 637-9 Clarence St., Los Angeles, Calif., is pioneering in rubber flooring manufacture on the Pacific Coast and has made several large contracts for supplying its products to southwest buyers. The material is being made in tile and sheet and in many patterns. The company is also doing a very large amount of heavy belt making for cement and rock-crushing plants, also making considerable 2½-inch oil-drilling hose, and an average of half a mile of radiator hose daily. President E. M. Smith is convalescing from a severe mastoid operation.

Coast Tire & Rubber Co., Oakland, Calif., according to President Louis S. Budo, is meeting with much success in the operation of its chain of factory stores on the Pacific Coast, and plans to add several more later in the year. The company also does a considerable direct mail order business in tires that is said to be growing steadily.

Samson Tire & Rubber Corp., Los Angeles, Calif., celebrated the biggest quarter in its history by moving in May into a new two-story extension erected adjacent to its big factory in Compton, one floor of which is used by the office staff and the other for warehousing. The moving allows for greater production of tires and tubes in the main factory, which is working overtime to its utmost capacity. Plant No. 2 in San Diego is also adding rapidly to its output. Clinton C. Prather, who recently took charge of the eastern branch established in Akron, has formed a district sales office in Atlanta, Ga., in addition to the Newark, N. J., branch, and is arranging for distributing Samson products on a large scale in the entire eastern field.

Pacific Goodrich Rubber Co., Los Angeles, Calif., has just received from the Orient its first shipload of crude rubber for the newly-opened factory in Los Angeles. Operations at the new works are running smoothly and the output is being steadily stepped up. The factory two weeks ago sent out its first carload of tires, the shipment being sent to the San Francisco branch for distribution in the upper Pacific Coast territory.

Goodyear Tire & Rubber Co., Akron, O., is making a special survey of its plants in Los Angeles, Australia, and England through its general production superintendent, William Stephens. On his way to Australia he will visit the big Goodyear rubber plantation in Sumatra. Coast trade conditions, he states, are remarkably good.

Golden State Rubber Mills, Los Angeles, Calif., according to President E. S. Long, has been running two shifts daily for several months on oil field supplies, repair stocks, and various mechanical rubber specialties.

Rubber Sidewalk. The first rubber sidewalk in the Far West, it is said, has just been laid by the Wright Rubber Products Co., Racine, Wis., in front of the new Oviatt Bldg. on S. Olive St., near Sixth, Los Angeles, Calif. It is of novel pattern tile, 7-8 inch thick, and is attached to a plank base which in turn rests upon cross beams set in concrete. The local representative, G. M. Anderson, 601 S. New Hampshire Ave., lately returned from a visit to the company's factory.

C. M. Simmons, former Miller Rubber Co. branch manager in Los Angeles, has become assistant manager of the California branch of the Federal Rubber Co. in San Francisco, which distributes Fisk Tire Co. products.

The Lombard J. Smith Co., 324 North San Pedro St., Los Angeles, Calif., has been appointed California agent for the Utility Mfg. Co., Cudahy, Wis.

The Freeport H. & M. Tire Shop, Inc., has taken over the business of the H. & M. Tire Shop, Freeport, Ill. Clifton R. Mellin is president.

Midwest

The B. F. Goodrich Rubber Co., will soon have a new branch building at St. Louis, Mo. It will be located on the corner of Chouteau and Theresa avenues, three stories high with basement on the level with the railroad tracks.

J. H. Simons has been appointed western division manager for Lee of Conshohocken with headquarters at Kansas City, Mo. Mr. Simons was formerly district sales manager in charge of the Kansas City district and was afterwards made assistant general sales manager at Conshohocken.

The Akron Rubber Reclaiming Co., Barberton, O., is planning the establishment of a new branch plant at East St. Louis, Ill., which will be operated by a new subsidiary, the Midwest Rubber Reclaiming Co. The new company is being chartered with a capital of \$1,000,000 under the Missouri laws. The mill will be equipped for a reclaiming capacity of about 25 tons of crude rubber per day and will employ about 100 persons. J. B. Huber, president of the Akron company, will be one of the heads of the new organization.

H. W. Kuehne has been appointed manager of the Indianapolis branch of the United States Rubber Co. Mr. Kuehne has been associated with the company for fifteen years.

The Firestone Footwear Co. has placed S. R. Pletz in charge of its Minneapolis, Minn., branch. Mr. Pletz was formerly with the Servus Rubber Co., and was also connected for a time with the Beacon Falls Rubber Co.

The Fisk Tire Co. has made several changes in its personnel at the Salt Lake City, Utah, branch. S. M. M. McCubbin has been made assistant sales manager, and E. J. Parkin is traveling for the company in southern Utah, his place as adjuster being filled by Paul Lynch.

The Moline Mfg. Corp., Moline, Ill., reports that conditions in molded rubber products in the Midwest are look-

ing better than they did some time ago, and the outlook for future business is extremely bright, according to Maurice E. Steele, sales manager.

Wheatley Rubber Co.

Production at the Wheatley Rubber Co., Fond du Lac, Wis., is now 100 tires daily, with a crew of 25 men employed and every prospect for a steadily increasing volume of business. The company is now at its maximum production with the equipment available, but orders now in the hands of manufacturers for additional molds, will soon call for an increase in the number of employees, when it is planned to manufacture a complete line of automobile tires in cord and balloon types.

George H. Wheatley, president of the company, is one of the pioneers in the automobile tire industry and has been responsible for a number of inventions which are now in use. He designed and built the first set of tires which withstood a 500-mile automobile race at Indianapolis, and is the inventor of a rubber tire flap in universal use at present.

Rub-Tex Reorganized

The Rub-Tex Products, Inc., Indianapolis, Ind., which has been in the hands of a receiver, has been taken over by new interests and is in process of reorganization. The new owners are Harley L. Clarke, Chicago and Indianapolis utility promoter; Norman A. Perry, president of the Indianapolis Power & Light Co.; James E. Perry, president of the Indianapolis baseball club; and Fred G. White, Detroit.

The new corporation, to be known as the Rub-Tex Products Co., will continue to manufacture rubber battery boxes, floor mats and other rubber composition products, and hopes to have an annual output in excess of \$15,000,000 a year. Edwin H. Emrich, former president, will also continue president of the new concern with Mr. White as his assistant.

Los Angeles Rubber Group, A. C. S.

Sixty-three members were enrolled at the organization meeting and dinner, on May 11 at the Mary Louise restaurant, Los Angeles, of the Los Angeles Group of the Rubber Division of the American Chemical Society. The officers elected were: President, R. B. Stringfield; vice president, A. K. Pond; secretary-treasurer, E. S. Long; and executive committee, C. R. Park, E. S. Long, and A. K. Pond. A constitution and by-laws were adopted.

A special guest was Dr. Richard C. Riehl of the Rubber Research Institute, Buitenzorg, Java, who had been spending a few days in Los Angeles before visiting

Akron. He treated the members to an interesting description of the work being done and the success achieved in rubber cultivation under the auspices of the Netherlands East Indies government. The round table discussion on calendaring proved to be exceptionally interesting. J. P. McIntire of Goodyear's presided, Arthur Kelly of Goodrich's explained the new weftless mode of calendaring, and L. A. Whitcomb of Goodyear's gave a practical talk on the mechanical side of calendaring. Many questions and answers brought out a lot of additional good information of practical value.

Canada

It is believed by prominent men in the rubber industry that the decline in crude rubber may result in a reduction in tire prices some time in July. It is also stated that tire prices are now at the lowest level in the history of the industry. Although rubber is weak, cotton, an important factor in tires, is at a much higher price level than a year ago. Other influences may enter into this matter before tire prices are changed, however.

A reduction has been made the past month in the price to dealers of rubber heels. There has been keen competition by importers who are selling heels at slightly lower figures than Canadian made goods. A decline in price of friction tape has been announced by manufacturers and jobbers and quotations are now one cent per pound lower than former levels.

Sales of garden and lawn hose are on the increase as the retail selling season is just commencing. Dealers are now displaying this line as well as advertising it and sales are being made despite the coolness of the weather. Prices are unchanged from the early booking season with the exception that one per cent is deducted for sales tax reduction.

The time limit for the 5 per cent discount on fall orders came to an end on May 1. It is reported that manufacturers are holding prices very firmly and special discounts are difficult to obtain. Manufacturers, however, expect that since the abandonment of restriction and the decline in crude rubber, footwear prices will probably be lower this fall.

Seiberling Rubber Co. of Canada, Ltd., donated to the Toronto Bonspiel Committee a handsome trophy to be contested for each year for a period of twelve years. C. A. Jones, vice president and general manager, recently presented the trophy to the Stratford Rink, winner at the Curling Bonspiel during the week the contest was on.

G. D. Allard, credit manager of the Canadian Goodrich Co., Ltd., donated a pair of men's rubber fishing boots for the member's competition at the annual meeting of the Canadian Credit Men's Trust Association, Ltd., held in Montreal recently. Mr. Allard was chosen one of the new governors of the association at this meeting.

Hilder Rubber Co., Ltd., is making a public offering of shares in order to increase production of the present plant in Toronto to 25,000 puncture-proof and 100,000 non-creep tubes per annum.

C. H. Carlisle, president and manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ontario, will address the third annual convention of the Canadian Chamber of Commerce held in Quebec City on June 7 to 9.

J. W. Green, Dominion Rubber Co., Ltd., has been elected one of the new governors of the Canadian Credit Men's Trust Association.

Quesnel & Frere, Montreal, representatives of the Miller Rubber Co., Akron, O., maker of Shuglov light weight rubbers and other rubber specialties, report splendid business in this particular line.

Dominion Rubber Co., Ltd., has issued a new map of distinct value to motorists as it combines Ontario and Quebec on one sheet, a convenience long wanted by motorists.

Canadian I. T. S. Rubber Co., Ltd., West Toronto, Ont., has recently started a national newspaper advertising campaign for Viceroy erasers and rubber bands.

Eberhard Faber, Brooklyn, N. Y., maker of pencils, erasers, etc., is advertising and using *Printer's Ink* freely in the Dominion, the publicity being handled by a Canadian advertising agency.

Dominion Rubber Co., Ltd., held its annual meeting in Montreal recently and the entire board was reelected.

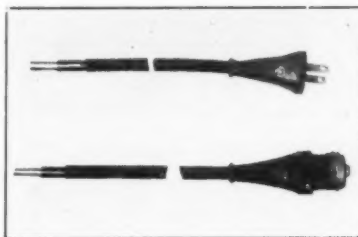
A. E. King, assistant general manager of the Dunlop Tire & Rubber Goods Co., Ltd., Toronto, recently visited his company's branch office in Halifax, N. S., and also St. John, N. B., the city of his birth.

Coutlee-Muir Rubber Corp., Ltd., Montreal, is to be liquidated and George Duclos has been appointed receiver.

Gutta Percha & Rubber, Ltd., is advertising "GP" gum cushioned tire and pure gum tubes extensively through Canada.

All-Rubber Cord Sets

The merchandise department of the General Electric Co., Bridgeport, Conn., announces new GE flex all-rubber cord sets,



GE Flex Sets

made up in 10 and 20 foot lengths of No. 16 and No. 18 type SJ GE flex junior all-rubber cord. One end of the cord has an all-rubber cap, while the other end is

Canadian Manufacturers

Oppose Tariff Reduction

In support of their contention that the rubber manufacturers of Canada have not used the tariff protection to enhance the price of their goods, the Rubber Association of Canada submitted briefs to the Tariff Advisory Board at Ottawa on May 15.

Various types of rubber footwear were exhibited to prove that when quality was considered, footwear was as cheap in Canada as in the United States. There are about seven per cent higher prices on tires in this country.

The Consumers' League is asking for a reduction in the tariff on rubber goods, claiming that the protection ranging from 20 to 30 per cent is too high, that 33 per cent of the costs went into raw material, a large portion of which was for rubber which the Canadian manufacturer bought on equal footing with the United States firms. Seventeen per cent went into wages which were about the same in the two countries as was also the overhead of 23 per cent. Accordingly there was only 27 per cent of the costs left on which the United States might have some advantage.

Arthur Hannay, secretary of the Rubber Association, contended that a reduction in the duties would enable the United States manufacturers to get by the Dumping Act and flood the Canadian market when under stress in their own country.

Canadian Automobile Production

April production of automobiles in Canada, as reported to the Department of Commerce by the Dominion Bureau of Statistics, was as follows: Passenger cars, 20,546; trucks, 3,694; as compared with production in March of 7,478 passenger cars and 2,246 trucks; and production in April, 1927, of 20,890 passenger cars and 3,721 trucks.

stripped ready for wiring. It may also be obtained with a pony attachment compound plug body and all-rubber cap. The cord and cap consist of one mold, the prongs being molded into the cap, eliminating the necessity of wiring the cap, and also eliminating the breaking of wire at cord holes or breaking of compound. This set is particularly recommended for hard service, and is suitable for use in railways, mines, ships, construction work, and industrial service in general.

Rubber Fringe

An exclusive French creation in an evening frock was recently noted which employed rubber fringe as an ornament. The gown was of beaded georgette and the fringe held in place by paste beads was part of the general scheme of decoration. The delicate shade of the georgette was duplicated in the fringe.

Obituary

Veteran Rubber Sundries Manufacturer

The death on May 4 of Russell Parker, president of the rubber goods manufacturing firm of Parker, Stearns & Co., Brooklyn, N. Y., and other corporations, removes one of the oldest and most esteemed manufacturers in the trade. His demise occurred at his home 102 Greenway North, Forest Hills Gardens.

Mr. Parker, who was seventy-six years



Russell Parker

of age, was born in New York City, his father being the proprietor of the Parker Coffee House in John St. He was educated at the Polytechnic Institute, and was at one time president of the Montauk Theatre Co. and of the Alpha Rubber Co. of Montreal.

One of the founders of the Union League Club of Brooklyn, he held life memberships in the Red Cross, Navy League, Mecca Temple, and was also a 32nd degree Mason.

His wife, Emma M. Parker; a son, J. Russell; and two daughters, Mrs. Grace E. Street of Montclair, N. J., and Mrs. Norma A. Mercer of Forest Hills Gardens survive Mr. Parker. The funeral services, conducted by the Rev. Dr. S. Parkes Cadman, were held privately, with burial at Greenwood Cemetery.

Founder of Scott Company

Henry L. Scott, president and founder of the Henry L. Scott Co., manufacturer of testing apparatus, died April 27 at the Jane Brown Hospital, Providence, R. I., at the age of forty-nine years.

Ill health the past few years prevented Mr. Scott's active participation in the management of the affairs of the Scott company, which he founded in 1899, afterwards being joined by his brother when the concern was operated as a partnership. On January 1, 1926, it was incorporated with Mr. Scott as president and David C. Scott as treasurer.

Of a retiring disposition, Mr. Scott never sought or accepted honors or offices

although he was an untiring worker in the many technical societies of which he was a member, which included the American Society of Mechanical Engineers, Textile Institute of Manchester, England, and American Society for Testing Materials. He was a 32nd degree Mason, Knight Templar and Shriner, and was also connected with many social organizations in Rhode Island, of which state he was a native. Deeply interested in the Textile Committee D-13, American Society for Testing Materials, he was very active in connection with it, serving as one of the Executive Committee for some time.

A man of marked ability, he combined the rare qualities of a financier, inventor and manufacturer to which is due, in a great measure the success of the Scott company.

Mr. Scott is survived by his wife, Bertha Angell, and one daughter, Ruth Angie.

General Manager Hale Rubber Co.

George Frederick Fisher, general manager of the Alfred Hale Rubber Co., Atlantic, Mass., died April 12 at Quincy, Mass.

He was born April 25, 1874, at Abilene, Kan., and attended school there. In 1897 he graduated from the University of Michigan, receiving his degree in electrical engineering.

His first position was with a saw mill in Mexico where he remained two years, and



G. F. Fisher

with A. Bailey, of Torreon, owned and operated a machine shop. From 1905 to 1909 he was chief master mechanic for the Continental Rubber Co. of Torreon, Mexico, and from October, 1909, until June, 1910, was employed by the Intercontinental Rubber Co. He then went to the Century Rubber Co., Plainfield, N. J., and joined the United States Rubber Co. in 1913 serving as technical rubber expert, ending his association with the company in 1923. His last connection was with the Alfred Hale Rubber Co.

Several factories were constructed by Mr. Fisher for the Continental Rubber Co. in Mexico, and he has to his credit about fifty patents all of which are being used in connection with the rubber industry. In 1910 he spent eight months in South America exploring the country and studying crude rubber conditions there.

Mr. Fisher is survived by his wife, Dora C. Fisher and daughter, Dorita.

Mrs. Webster Norris

It is with deepest regret that we announce the passing away of Mrs. Margaret Stetson Norris, the wife of Webster Norris, technical editor of INDIA RUBBER WORLD. A cold contracted the latter part of April developed into pneumonia, and her death occurred in Brooklyn on May 12, 1928.

A woman of splendid character with high ideals and a conscientious regard for and devotion to church, truth and duty, Mrs. Norris's early training was in a household whose standards of conduct and living were strict. Born in Thomaston, Maine, December 6, 1865, she was educated in the public schools of Melrose, Massachusetts, and was married to Webster Norris, September 26, 1888. Her family was of old Puritan stock, an ancestor on the paternal side was Cornet Robert Stetson, of Scituate, one of the important men in the Plymouth colony.

Mrs. Norris's career was in her home, to which she devoted all her interest and attention. She spent many hours in the care and cultivation of her beautiful garden at her residence at Hempstead, Long Island.

To Mr. Norris has been extended the sympathy of a large circle of friends in the rubber industry with which he has been so long associated.

Interment was in the family plot at Reading, Mass.

U. S. Replaces France as Chief Tire Exporter

In 1927, France ranked second among the countries exporting rubber tires, according to figures compiled by l'Exportateur Francais and transmitted to the Bankers Trust Co., of New York by its French Information Service. Before 1927 she had ranked first but that place has now been taken by the United States. France's exports nevertheless have continued to increase and this change in rank is due to the unusual development of American exports rather than to slackening of French industry. From 1,677,000 tires in 1924 her exports have increased to 1,873,000 in 1925, 1,915,000 in 1926 and 2,234,000 in 1927. These figures represent, respectively 35 per cent, 30 per cent, 32 per cent and 27 per cent of the total world exports of rubber tires.

IMPORTS OF TIRES INTO THE UNITED STATES during 1927 reached a total of 5,450, value \$75,615; France providing the greatest number, 2,876, with United Kingdom second with a total of 1,563.

Rims Inspected and Approved by The Tire & Rim Association of America, Inc.

Rim Size Motorcycle	April, 1928		4 Months, 1928	
	Number	Per Cent	Number	Per Cent
24 x 3.....	7,724	0.3	17,172	0.2
26 x 3.....	1,703	0.1	14,475	0.2
28 x 3.....	.....	.....	452	0.0
Total.....	9,427	0.4	32,100	0.4
Clinchers				
30 x 3½.....	11,795	0.5	137,185	1.7
31 x 4.....	52	0.0	1,563	0.0
Total.....	11,847	0.5	138,748	1.7
18" Balloons				
18 x 3½.....	.....	.....	9,362	0.1
18 x 4.....	124,604	5.4	470,083	5.6
18 x 4½.....	7,658	0.3	30,843	0.4
18 x 5.....	20	0.0	20	0.0
Total.....	132,282	5.7	510,308	6.1
19" Balloons				
19 x 3½.....	286,320	12.4	738,455	9.3
19 x 4.....	200,512	8.7	779,658	9.4
19 x 4½.....	74,094	3.2	360,592	4.3
19 x 5.....	32	0.0	32	0.0
Total.....	560,958	24.3	1,878,737	23.0
20" Balloons				
20 x 3½.....	78,180	3.4	265,087	3.2
20 x 4.....	389,938	16.8	1,313,947	15.7
20 x 4½.....	11,791	0.5	139,076	1.7
20 x 5.....	50,406	2.2	189,911	2.3
20 x 6.....	5,350	0.2	42,068	0.5
Total.....	535,665	23.1	1,950,089	23.4
21" Balloons				
21 x 3½.....	63,059	2.7	226,664	2.7
21 x 4.....	629,501	27.3	2,206,433	26.9
21 x 4½.....	86,628	3.7	318,266	3.8
21 x 5.....	35,356	1.5	184,624	2.2
21 x 6.....	2,554	0.1	5,631	0.1
21 x 6.....	442	0.0	1,385	0.0
Total.....	817,540	35.3	2,943,003	34.7
22" Balloons				
22 x 3½.....	.....	.....	1,509	0.0
22 x 4.....	100	0.0	856	0.0
22 x 4½.....	.....	.....	640	0.0
Total.....	100	0.0	3,005	0.0
High Pressure				
30 x 3½-23.....	2,522	0.1	16,439	0.2
31 x 4-23.....	.....	.....	.....	.....
32 x 4½-23.....	7,732	0.3	21,413	0.3
32 x 4-24.....	5,602	0.2	18,833	0.2
33 x 4½-24.....	.....	.....	406	0.0
32 x 3½-25.....	.....	.....	.....	.....
33 x 4-25.....	.....	.....	1,293	0.0
34 x 4½-25.....	564	0.0	1,213	0.0
Total.....	16,420	0.6	59,597	0.7
20" Truck				
30 x 5.....	159,982	6.9	621,716	7.4
32 x 6.....	38,938	1.7	110,858	1.3
34 x 7.....	8,241	0.4	33,152	0.4
36 x 8.....	5,989	0.3	20,490	0.3
40 x 10.....	729	0.0	2,142	0.0
Total.....	213,879	9.3	788,358	9.4
22" Truck				
36 x 7.....	1,520	0.0	2,649	0.0
24" Truck				
34 x 5.....	368	0.0	6,539	0.1
36 x 6.....	7,056	0.3	15,772	0.2
38 x 7.....	6,924	0.3	17,420	0.2
40 x 8.....	2,178	0.1	7,574	0.1
44 x 10.....	160	0.0	480	0.0
Total.....	16,686	0.7	47,785	0.6
Grand total.....	2,316,324	.....	8,354,379	.....

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

NUMBER	INQUIRY
1095	Rubber molds for cold casting plastic products.
1096	Source of supply for solvent and sweet rubber cement naphtha.
1097	Commercial rubber plating.
1098	Data on the manufacturing and retail value, and quantities sold to farm, rural and urban consumers of hot water bottles.
1099	Ivory finished tire paint.
1100	Collapsible rubber boats
1101	Source of supply for Palmer's carbon black.
1102	Manufacturers of rubber trimming machines.
1103	Source of supply for leather dust or leather skivings.
1104	Firm marketing Plastikon.
1105	Machine for stamping letters and numbers on aluminum plates, similar to ones used for embossing rubber articles during vulcanization.
1106	Manufacturer of Rubberite.

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

NUM- BER	COMMODITY	CITY AND COUNTRY	PURCHASE OR AGENCY
30,755	Sanitary rubber goods.....	Prague, Czechoslovakia.	Either
30,757	Canvas shoes with rubber soles and heels.....	Baghdad, Iraq	Either
30,767	Sport goods	Vienna, Austria	Agency
30,781	Druggists' sundries	Santo Domingo, Domin- ican Republic	Agency
30,821	Druggists' sundries.....	Rosario, Argentina	Purchase
30,826	Rubber heels	Goteborg, Sweden	Purchase
30,827	Druggists' sundries.....	Merthyr-Tydfil, Wales.	Both
30,828	Rubber toys, novelties and syringes	Merthyr-Tydfil, Wales.	Both
30,855	240 pairs high boots.....	Cork, Ireland	Both
30,919	Crepe rubber soles and erasers	Baghdad, Iraq	Purchase
30,920	Tires and druggists' sundries.	Warsaw, Poland	Both
30,936	Tires	Prague, Czechoslovakia.	Purchase
30,998	Football bladders and tennis balls	Tallinn, Estonia	Purchase
31,000	Rubber footwear, soles and heels	Ceuta, Spanish North Africa	Purchase
31,001	Transmission belting.....	Berlin, Germany	Purchase
31,002	Sport goods.....	Hamburg, Germany	Agency
31,003	Druggists' sundries	Tallinn, Estonia	Agency
31,018	Tires	Cracow, Poland	Both
31,201	Soles and heels.....	Hamburg, Germany	Agency
31,218	Toys	Milan, Italy	Both
31,220	Rubber goods.....	Santiago, Chile	Agency
31,230	Toys	Valparaiso, Chile	Agency
31,231	Automobile rubber accessories and novelties	Rome, Italy	Both
31,296	Rubber leather composition.	Augsburg, Germany...	Purchase
31,324	Rubber heels	Copenhagen, Denmark..	Purchase
31,325	Rubber footwear	Copenhagen, Denmark..	Purchase
31,326	Bathings caps and slippers, aprons	Cardiff, Wales	Purchase
31,327	Druggists' sundries	London, England	Agency
31,328	Belting	Rosario, Argentina	Purchase
31,341	Sanitary rubber goods.....	Buenos Aires, Argen- tina	Either

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

NUMBER	SPECIAL CIRCULARS
1936....	Mechanical Rubber Goods Exports.
1940....	Sundry Market in Mexico.
1948....	Canadian Footwear Exports First Quarter of 1928.
1952....	British Rubber Footwear Exports March and First Quarter 1928.
1953....	Exports of Rubber Footwear from United States, Canada, and United Kingdom First Quarter 1928.
1955....	Rubber Footwear Exports.
1960....	Comparative Tire Exports from United States, Canada, United Kingdom and France, First Quarter 1928.

Southwest Cotton Futures Higher

Cotton farmers in Arizona are contracting their 1928 crop at an average of 20 cents for short (Acala) and 40 cents for long staple (Pima), or 5 cents a pound more than 1927. Last year's sales of 73,000 bales of short and 23,000 bales of long staple yielded about \$12,000,000 for the state. Acreage this year will be about 36 per cent greater than in 1927, mostly in the Salt River Valley.

Legal

Adverse Decisions in Interference

BATTERY JARS, etc. Pat. No. 1,515,381, Boyer and Butfield, method of manufacturing battery jars and similar articles of hard rubber, decided March 23, 1928, claims 1 to 5, inclusive. *Official Gazette*, Vol. 370, p. 1.

Patent Suits

TIRE FLAP. 1,612,788, J. Walten, appeal filed Feb. 1, 1928, C. C. A., 7th Cir., Dec. 4005, O. C. Tingley & Co. et al v. Badger Rubber Works. *Official Gazette*, Vol. 369, p. 490.

TIRE FLAP. 1,612,788, J. Walten, filed Feb. 7, 1928, D. C. N. J. (Trenton), Dec. E 3068, C. O. Tingley & Co. et al. v. The B. F. Goodrich Rubber Co. Dec. E 3069, C. O. Tingley & Co. et al. v. The Goodyear Tire & Rubber Co., Inc. *Official Gazette*, Vol. 370, p. 8.

PNEUMATIC TIRE. 1,436,394, P. E. Hawkinson, process of repairing pneumatic tires and an improved patch, D. C., S. D. N. Y., Dec. E 34/323, The Kehawke Mfg. Co. v. The Eastern Tire & Rubber Co., Inc. Patent held valid and infringed Mar. 13, 1928. *Official Gazette*, Vol. 369, p. 733.

TUBE COMPRESSOR. 1,297,456, A. J. Frey, D. C., S. D. N. Y., Dec. E 32/190, Brass Goods Mfg. Co. v. M. Weiss & Sons, Inc., et al. Patent sustained Mar. 20, 1928. *Official Gazette*, Vol. 370, p. 8.

Trade Marks

DIAMOND PROJECTION ON TIRES. Goodyear T. & R. Co. v. Robertson, Commissioner of Patents, U. S. Circuit Court of Appeals, Fourth Circuit. A mark described as consisting of circumferentially-disposed outstanding diamond-shaped blocks spaced by grooves and impressed upon the tread surface of a tire. Held not registrable as a trade-mark for tires, since the mark consists "of something which is a mechanically functional feature of an automobile tire, and not registrable at all, and is descriptive of the particular type of tire." Decision of district court affirmed. *Official Gazette*, Vol. 370, p. 254.

Hardier Roots for Hevea

Much success is said to have been attained by Dutch East India planting experts in their efforts to produce a Hevea strain having a strong, disease-resisting root system through hybridizing *H. brasiliensis* and *H. guianensis*. Although the former yields the better quantity and quality of latex, it appears to be more subject to root rot than the latter. Choice *H. brasiliensis* is bud grafted on young *H. guianensis*, and as soon as the scion of the former develops sufficient strength, the trunk of the latter is cut off just above the juncture of the two species, and the tree grows as a *H. brasiliensis*. The roots of the hybrids continue to be quite immune to disease, and the growth of the trees is said to be very satisfactory. If they seed and propagate equally well and give a fair latex yield, it is likely that before long hybridized Hevea may be planted on a large scale.

Texas' Carbon Black Output Mounts

Although the law allows only residue from natural gas after it has passed through casinghead gasoline plants to be burned for making carbon black, the production of the latter in Texas this year is expected to exceed 75,000,000 pounds, according to information received by the oil and gas division of the state railroad commission. In 1927 the output of carbon black in Texas was 20,174,409 pounds. It is stated that before the end of the year more than a dozen large plants will be in operation, most of them in the Panhandle district.

Origin of Rubber

It is interesting to note in a recent article in the *Scientific American* that the world owes rubber and several important uses of it to the Mayas and adjacent tribes in the wet lands of Central America including the Olmeca, or Rubber People. Several doll-like effigies recovered from the Sacred Cenote at Chichen Itza are believed to be the oldest specimens of rubber. In the same city a great ball court was also discovered in which a game was played with a large rubber ball, similar to the modern game of basketball with the rings set vertically instead of horizontally.

Rubber was also frequently used for incense and as a binding material over cord wrappings and for tipping drum sticks. It was used to waterproof cloth and strips of beaten bark reduced to the thickness of stout paper. A Guatemalan document has been unearthed dated 1540 which says "rubber whose profitable uses the Spaniards took from this province where the people were much given to varnishing boots, capes and other useful objects to make them waterproof, and to make tennis balls."

The Paya, Mosquito and Sumo Indians of Central America make their ponchos and duffle bags waterproof, and it is somewhat surprising to learn that even the word guayule had its source in the Aztec words *hue* or *guay*, meaning old, and *ulli*, meaning rubber, a literal translation being "old-fashioned rubber."

Tires Derive Strength from Small Particles

The tremendous forces exerted at the surfaces between minute particles contained in them account for the strength and usefulness of rubber tires and macadamized roads, according to Dr. S. E. Sheppard, of the Eastman Kodak Co., in an address delivered before the Institute of Chemistry of the American Chemical Society at State College, Pennsylvania.

"Tremendous strength can be imparted to so weak and plastic a material as rubber," said Dr. Sheppard, "by introducing within it the huge forces developed between the surfaces of minute particles of fillers and the rubber itself. These forces, of a magnitude in rubber tires of many tons per square inch of rubber, are dependent upon the area of the surface of the particles and hence on their size. It is for this reason that the accurate measurement of sizes and particles is of prime industrial importance."

In the same way, Dr. Sheppard pointed out, a permanence is given to roads by the production in surfacing materials of a grading of particle size from large stone down to infinitesimal particles. In a like manner, rubber tires depend for their strength upon the production within the body of the rubber mixture of immense areas for the play of these interfacial forces between the rubber and the filler.

Poor Roads Increase Gasoline Consumption

According to figures prepared by the Washington State College, motorists of the U. S. pay a bad roads tax equivalent to 22.3 cents on every gallon of gasoline consumed on a poor highway.

"On a basis of a speed of 33 miles per hour," the report states, "tests show the cost of gasoline and tires per one thousand miles over a certain rough road for an average four cylinder car weighing 3,500 pounds loaded, was \$35.10. At the same speed, the cost for the same car over a very smooth improved road was only \$12.80."

Removal of Dried Ink from Vulcanite

The German rubber technologist, Dr. Rudolph Ditmar, has found that the greenish gray discoloration caused by prolonged immersion in water or aqueous solutions to remove dried ink may be avoided by using a solution of sodium hyposulphite, which effects rapid cleaning without affecting the vulcanite.

The Rubber Industry in Europe

Great Britain

The Premier's "Blunder"

Premier Baldwin's blunt announcement concerning the removal of restriction and its immediate effect on the rubber market will continue for some time to agitate the minds and pens of those interested in the rubber industry. What is known as the Premier's blunder has called forth a great deal of more or less uncomplimentary criticism, even in the House of Commons, and it has fallen to the lot of Mr. Amery to defend his chief as best he may. When all is said and done, one cannot help feeling a little sorry for all those in high places who for the last five years and more have been trying so hard to save the rubber planting industry and at the same time to please everybody while doing so.

It is not so long ago that as more drastic restriction failed to keep rubber even above the pivotal price of 1 shilling 9 pence, the clamor was raised that restriction had failed; that the British rubber industry would be ruined because of the scheme which had helped the American reclaim industry; had stimulated Dutch production to a point where it was dangerous to British prestige in the industry; had evoked the menace of native rubber; and the authorities were scolded for not doing anything about the matter. Well, the Premier decided to do something. We may believe that he was utterly sincere when he stated that he had acted in the best interests of the industry, but it might have been foreseen that very few would be pleased with the action he did take.

One company director was so ungrateful as to remark that the one good thing about the Premier's performance was that the rubber industry would thereby soon become free to take care of itself. And this when six years earlier said rubber industry had practically implored the government to take care of it as it could not do so itself!

Of course, after the industry recovers from the first effects of the shock, it will probably be found that things could have been worse. In fact, one already hears more cheerful views expressed as regards the future. Thus it is pointed out that the low price will result in laying the bogey—reclaim; that full production will not mean 40 per cent above present output as the actual amount of restriction has been much below this for some time past; that American consumption increased from 97,799 tons to 103,793 tons during the first quarter of 1928; that imports of crude rubber into Germany increased from 5,674 tons for the first two months of 1927 to 7,307 tons for the first two months of the current year; that record deliveries have been made to British manufacturers during March—8,078 tons against 6,496 tons in February, and a total of a little over

12,000 tons over the first quarter of 1927.

But naturally pessimists will draw attention to the reports that numbers of manufacturers have cabled East to tap to the limit; that one firm has sold forward 1,000,000 pounds of rubber for 1929 at around 9 pence per pound; that some firms have omitted their interim dividends, while a few others have resolved not to distribute any dividends at all for the past business year's working.

What To Do Now?

All this helps very little toward the problem of finding a scheme to take the place of the Stevenson Scheme. The Dutch delegates have gone home again, and while it may be considered a favorable sign of their willingness to come to some kind of terms that they came to England instead of the British having to go to them as has hitherto been the case, negotiations have not as yet given any definite results.

Well-known figures in the rubber industry like Eric Macfadyen, former Chairman of the Rubber Growers' Association, and James Fairbairn, favor consolidation of the industry into larger units. Mr. Fairbairn has worked out a scheme to meet the present emergency involving Dutch and British cooperation and the establishment of a central selling agency. The successful working of the plan requires all further planting of rubber to be subject to a government license; and further, the voluntary consolidation of the three or four largest British agency firms with invitations to the smaller ones to join interests, and the grouping of estates on a geographical basis under a central management controlling an average of 250,000 acres. Thus there would be a Sumatra company, a Java company, one for each state in the Federated Malay States, and one each for Ceylon, Burma, South India and Borneo.

Consumption and Production

The decision to end compulsory restriction by November 1, 1928, has led Messrs. Symington & Sinclair to issue revised estimates of production and consumption of crude rubber during 1928. It is calculated that standard production figures, together with output figures from Singapore and Penang will work out at 319,000 tons for all Malaya during 1928. On this basis, 60 per cent is about 16,000 tons per month. However, a large proportion of producers, native and European, are expected to produce to capacity, so that it is considered that there will be an accumulation of something like 42,000 tons for the six months, May to October. In addition, there are still old export rights to be taken

into account, and these have been put at 9,000 tons. The calculation for Malayan shipments during 1928 therefore comes out as follows:

	Tons
Actual Malayan produced rubber, January-March	54,000
April, estimated	15,000
May-October, six months at 16,000 tons a month	96,000
Add old export rights	9,000
Total to end of October	174,000
November-December, two months at 27,500 tons per month. Figured on estimated productive capacity of Malaya 330,000 tons per year	55,000
Add accumulation of six months	42,000
Total potential Malayan shipments	271,000

The revised estimate for Malaya is therefore 271,000 tons, against 196,000 tons in the original estimate.

In a similar manner the new figure of 62,800 tons, instead of 50,000 tons, has been arrived at for Ceylon. It is not expected that there will be any change in outputs due to lower prices, in the Dutch colonies, British India, British Borneo, and Sarawak, nor in French Indo-China or other sources of plantation rubber. But a total reduction of about 4,000 tons is looked for in the figures for wild rubber. In all, therefore, Messrs. Symington & Sinclair are of opinion that there will be available 667,000 tons of crude rubber, instead of 584,000 tons as at first estimated.

As for consumption, no very marked increase is expected owing to low prices, though it is expected that in America about 30,000 tons of reclaim will be replaced by crude rubber, so that the estimated consumption for 1928 becomes 655,000 instead of 625,000 tons.

Comparing the original and revised figures, we see that instead of a decrease in supplies of 41,000 tons, an increase of 12,800 tons is looked for.

The Dunlop Report

The Dunlop Rubber Co.'s net profits for 1927 came to £2,539,000, against £2,401,000 the year before, the annual report for 1927 shows. Out of net profits, £534,470 went for payment of preference shares and £1,704,400 for the 25 per cent dividend on ordinary shares. The general reserve fund has been brought to £2,600,000 by the addition this year of £500,000, including £113,029 premium on new issue of shares during the year. The amount carried forward to next year is £578,580.

While tire sales showed an increase of 20 per cent over previous best, and were more than double the total of 1923, profits were not in the same proportion, due to the heavy price cutting which developed throughout the world. The full effect of the duty in tires, said the chairman, Sir Eric Geddes, had not been felt during 1927 owing to large imports prior to the introduction of the duty.

Increasing sales necessitated the reorganization of the factory at Leicester; besides considerable extensions at Fort Dunlop and at the cotton mills at Roch-

dale. The reorganization of the Macintosh group of factories is now nearing completion, while further important plant developments had been made at the main factory at Manchester.

Increased quantity sales are also reported from the company's factory in Germany (42 per cent over last year) and the works in France (18 per cent increase). The American factory continued to make sound progress though operations were carried out on a slight loss. Besides the investment in the Dunlop Rubber Co. of Australasia, there had also been an investment in the rubber goods factory at Budapest which latter was turning out well.

In the East the company's plantations had been extended so that the planted area now was 56,000 acres instead of 46,000 acres.

At the conclusion of the meeting the board was given powers to issue, if required, a further 1,485,527 shares, making a total of 3,000,000 shares available for issue as required.

Reliance Co. Reorganized

The Reliance Rubberware, Ltd., has been formed to take over the business carried on by the Reliance Rubber Co., Ltd., Formosa St. and Amberley Rd., Paddington, London, W. 9., maker of rubber goods.

The business was established in 1889 by John Phillips Jones, and was converted into a private limited company in 1919, with a capital of 10,000 pounds. New capital, it is expected, will be used to carry on an extensive campaign of advertising and propaganda, and improved methods will increase output.

Fordyce Jones, who has been actively engaged in the manufacturing and selling organization of the concern for the past nineteen years, has entered into an agreement to act as managing director for a period of five years. The departmental managers are also continuing in the service of the company.

Industry in Hungary

Although not one of the largest, the rubber industry of Hungary is one of the most firmly established. It began in 1891 when the Hungarian Rubber Goods Factory (Ltd.) was established at Budapest, and was followed by the smaller firms of Dr. Dorogi & Co. and the Hungarian Rubber Mfg. Co.

The Budapest branch of the Wiener Bank Verein and the Dunlop Rubber Co. of Great Britain control the Hungarian Rubber Goods Factory, and it in turn controls Dr. Dorogi & Co. The Hungarian Factory produces the Cordatic tires and inner tubes, rubberized fabrics and sheetings, sanitary specialties, rubber soles and heels, aprons, toys, etc. It employs approximately 1,350 workmen. The Dorogi company employs about 400 hands. The Hungarian Rubber Mfg. Co. is a much smaller concern and manufactures canvas rubber soled shoes and hygienic products of the less expensive grades.

Germany

Price Drop

The sensational drop in the price of crude rubber following Premier Baldwin's announcement that restriction would be removed after November 1, 1928, has been given much publicity in the local press, and the inevitable result of this is that the public expects that the price of rubber goods will be cut too, and that at once. It is feared that as a consequence, pressure may be brought to bear particularly on weaker dealers, to lower prices prematurely. To forestall this, manufacturers and the rubber papers are urging all those concerned to impress upon consumers the fact that all producers and dealers have rubber and rubber goods on hand that had been purchased at a time when prices were higher than at present; that other materials used in the manufacture of rubber goods are now dearer than for some time, and finally, that wages have to be constantly adjusted in an upward direction.

The German Tire Manufacturers' Association came out with a definite statement in this connection, at a meeting held on April 27, 1928. This organization decided not to initiate any price changes for the present, since the drop in the price of crude rubber could not immediately affect costs of production because of expensive stocks still in warehouses, the rise in wages and salaries and other factors governing prices.

Rubber Thread Combine

For some time there has been a price convention in the German rubber thread industry. This has now been transformed into a sales syndicate to be known as Verkaufsvereinigung deutscher Gummifaden-Fabriken G. m. b. H. (German Rubber Thread Factories Selling Association). The aim of the new organization is joint selling, with the provision, however, that customers may continue to deal with the firm they prefer as heretofore. The following firms have joined the syndicate:

Carlswerk-Clouth, G. m. b. H., fur Gummifadenherstellung, Koln-Nippes; Gummwerke Elbe A. G., Klein Wittenberg (Elbe); Gottfried Hagen A. G., Koln-Kalk; Hoxter'sche Gummifadenfabrik G. m. b. H., Hoxter, Westphalia; Kolnische Gummifaden-Fabrik, vorm. Ferd. Kohlstadt & Co., Koln-Deutz.

Sales will be effected as before through the representatives who have been acting for the respective firms until now. But in those districts where the five firms have no representatives, inquiries and orders, with specification of the particular brands required, will have to be sent directly to the selling combine. Deliveries will be made by the factories to the customers without intervention of the combine. The president of the organization is Director Reinhold Rompf (Kolnische Gummifadenfabrik); Dr. Otto Geyer, business manager of the former price convention, has been nominated business manager of the new

body. The offices of the combine are at 1, Elisenstrasse, Koln (Cologne).

French Duties on Rubber Goods

Much satisfaction is expressed at the news that from April 16, 1928, German goods imported into France will receive most favored nation treatment, and will therefore be freed from the handicaps suffered in comparison with other foreign goods introduced into France. German trade had been considerably hampered by the former tariff agreements between France and Germany, but now it is expected that business between the two countries will be greatly stimulated and that the trade balance will be more favorable to Germany than has been the case during recent years. Since no exceptions are specified, German rubber goods will benefit to the full from the new provisions.

Competition in Tires

The growing encroachment of foreign rubber goods, particularly tires, on the home market has for long been a sore subject with local manufacturers, and more than once unpleasant comparisons have been made between the import duties on tires in Germany and in other countries. Of late a growing movement to check and eventually overcome the inroads of foreign tires has been making itself felt and much propaganda is being made for German tires and against the imported article. German tire manufacturers lowered their prices so that in many cases they were 15 per cent less than imported American makes; they learnt of the very favorable terms that foreign firms granted dealers and have now decided to follow suit, but what is more calculated to hurt the sales of foreign tires is the fact that German tire manufacturers, recognizing their shortcomings, have set themselves with a will to the task of overcoming these and are improving their product all the time. Competition is therefore being made more difficult for others. This is being felt by American concerns whose goods, though high in price, nevertheless enjoyed a certain preference because of their recognized superiority. But as the difference in quality is being evened up, the difference in price becomes a more serious handicap, and some American makes have had to be reduced in price in certain districts to facilitate competition.

German Crude Rubber Imports

Germany's net crude rubber imports were reported as 38,891 long tons as compared with net imports of 22,775 long tons in 1926 and 33,932 long tons in 1925.

More than one-third of the rubber imported in 1927 came from the Netherlands East Indies, usually the main source of Germany's supply. British possessions in the East rank next in importance in this trade with Brazil following.

The Rubber Industry in the Far East

Malaya

Aftermath of Restriction

The announcement that restriction is to be removed November 1 has caused astonishment and dismay here in rubber circles. It was the last thing that anybody expected; even the anti-restrictionists were not prepared for anything quite so sudden, and many pro-restrictionists are inclined to look at the future with great pessimism. The question of what policy to pursue in the six months yet remaining until restriction is finally abandoned is widely discussed. The better policy is of course for producers to maintain a conservative method of tapping until November 1, and this is what they have been urged to do. But it seems more likely that a large number will immediately proceed to tap heavily and accumulate stocks against the time when rubber will be free again. And this brings the labor problem to the fore once more. If planters tap to capacity it is more than likely that there may be a shortage of labor, but if prices continue low, such a state of affairs is not likely to go on for long, and it is more probable that we shall see much unemployment in Malaya, and also among Europeans.

Press Opinions

The *Straits Budget* publishes extracts from leading articles appearing in Malayan papers after receipt of the news of Premier Baldwin's announcement, from which we cull the following:

The *Singapore Free Press* says: "True to its conduct all through the Home Government has finally muddled the last phase of the restriction question. . . . It is a pitiful history of incompetency and the only satisfactory thing about it is that at least the industry knows now that it has got to fight its own battles."

The *Malaya Tribune* remarks that: "the first ruthless plunge into the cold water finds a great part of the industry able only to squeal. For ourselves, we welcome the decision as the only sane way out of the difficulty. Throughout the last two years the Stevenson Scheme has proved to be totally unworkable."

The *Malay Mail*, while convinced that restriction in the early years saved the industry, is fully alive to its numerous defects, and adds: "when the Stevenson Committee itself began monkeying with its fundamentals and raised the pivotal price it really struck a deadly blow at the justification for its continued existence as a purely defensive measure."

The *Malayan Daily Express* finds that the announcement: "will satisfy most anticipations, excepting the expectations of those who hugged the fond delusion that

the Stevenson Restriction Scheme . . . would never be wholly removed, though it might be greatly modified. . . . The worst effects of a slump might be greatly mitigated by the long notice that has been given, and by the continuation of the present scheme unmodified, thereby helping to reduce the stocks in London, which we are told are now the lowest since March, 1927. But if the industry finds itself unable to get over such depression without screeching, then we are justified in saying that restriction has been ten times more useless than its opponents had prophesied that it would be at its inception."

The *Penang Gazette* also is pleased that restriction is to go and says: "Restriction all along has been the life blood of the speculative growers. It has encouraged the weeds which, when deprived of their fertilizer six months hence, will vanish and leave the industry with a healthy soil on which it may grow to greater prosperity."

The *Straits Echo* is more than shocked and says rather wryly: "The decision is a complete victory for the anti-restrictionists—more complete, we have no hesitation in asserting, than ever they expected or desired."

The *Times of Malaya* is convinced that there is something behind the Premier's announcement: "It appears to us that the British Premier has thrown down the gauntlet to the Dutch. His statement is the broadest of broad hints. . . . that Dutch planters must cooperate with their British confrères or fight them in a price war that undoubtedly will be ruinous to them whilst nearly as bad for the British planter."

Results of Price War

The latest statement made by the *Times of Malaya* is one that is frequently heard from Britishers who are disgruntled at the refusal of the Dutch to cooperate with them and who would like to use force to make the Dutch join them. L. A. J. Rijk, of Kuala Lumpur sends an interesting letter covering this matter to the *Straits Times*. In reply to a statement made by a correspondent, he says that a slump in the rubber industry would of course mean financial loss to the Dutch—some estates may be wiped out and the natives in Sumatra and Borneo will have less money to spend on luxuries. But the country itself will not be materially affected for the simple reason that rubber does not occupy the same place in the Dutch colonies that it does in Malaya. Malaya does not grow the food it requires. In 1926 it imported rice to a value of \$70,000,000 and other foodstuffs, to a value of \$30,000,000, that is \$100,000,000 in all.

Malaya does not grow its own food, and when the commodity it has for sale is unsaleable, it will have to stop buying the food it requires or mortgage its future. Java and Madura produce not only enough food for their own requirements, though their population is ten times that of Malaya, but have a surplus to export.

Now the amount of native grown rubber produced in Java is negligible. All rubber coming from this island is estate rubber and does not exceed a few tens of thousands of tons, so that if every rubber estate here were wiped out, this would be very unpleasant for the shareholders, but the country as a whole would not be affected. Every single laborer on all these estates would immediately find work in other industries.

In Sumatra and Borneo conditions are different. Most of the rubber from Sumatra is estate rubber, but a great deal is native produce, while Borneo supplies chiefly native rubber. It is pointed out that although prosperity has spoiled the native worker so that he may not at first wish to work for the low wages which would be inevitable if rubber were 9 pence a pound or less, before long necessity would force him to do so.

Whatever happens to native rubber land in Sumatra and Borneo, the native owners there would still have their food, because in the above territories rubber is a secondary crop, and rice comes first, whereas in Malaya, the native farmer plants rubber only and must buy food with the proceeds, and if he cannot sell rubber has no money to pay for food.

Again, if native rubber collapsed entirely in Borneo and Sumatra, there are other agricultural industries where many natives could be used, the rest could get their living by collecting forest produce as they did before rubber became popular.

As for estate owners in Sumatra and Borneo, they would be in the same position as those in Malaya. But since the total capital invested by Europeans in the Dutch East Indian Estates is not more than a third of the European capital invested in rubber in Malaya, and furthermore capital in the Dutch colony is largely foreign, whereas in Malaya the capital is all British, a ruined rubber industry would not affect the Dutch colonies as a whole as it would Malaya. The Dutch East Indies have gone through worse crises before and will survive a crisis in rubber if it comes. They are not dependent on rubber for their food and general prosperity, while Malaya is.

Finally, it is claimed that possibly a larger proportion of Dutch estates would better be able to endure a slump than would most Malayan estates, as the former estates are on the whole the younger and were planted on more up-to-date lines. Moreover, if Malayan estates were able to build up reserves during restriction, it is to be expected that the Dutch had done even better.

Netherlands East Indies

Future Plantings

The near future in the rubber industry was the subject of an interesting paper read by Mr. Van de Hoop at a recent meeting of the Soekaboemi planters. After touching on the undesirable features of the scheme followed up to now, he said that owing to fixing of a basic price, opportunity was given for the development of substitutes for rubber and that synthetic rubber research was encouraged as well as native rubber. The greatest and not generally named enemies are the old estates and the capital invested in these, which chiefly are responsible for the basic price at present.

The sore spot in the rubber industry today is that these estates are insufficiently written off and only complete excision will remedy the matter. We are now at the beginning of a revolution in the rubber industry, he says. Everywhere it is seen that even ordinary selection is capable of giving an increase in yields amounting to 200 per cent. Personally he believes that it is possible to get yields that are at least five times as high as those obtained from the plantings made in 1910.

Each time a new success is reported from better grade material, the existing estates deteriorate in value, and the period of their usefulness is decreased. In future planters will have to be prepared to see their estates constantly requiring to be renewed if they are to remain paying propositions. And these new plantings will probably not be allowed to exist more than 15 to 20 years. So that the old slogan "Save your bark, it is your capital" will have to be changed to "Tap to the limit, because the capital in it must be gotten out with the highest profit. Everything will have to go and then we shall plant better material and that as closely as possible."

If the renewal of all estates older than 16 years is carried out over a period of 10 years, it will give the manufacturer time to adjust himself to the new situation and to find new markets for the quantities of rubber which will be produced in increasing quantities. By renewing the estates with superior material, the speaker showed, it is possible to effect a considerable reduction in the cost price. Under usual conditions, the average cost of half a kilo (1.1 pound) of rubber in West Java comes to 0.355 guilder cents, but this could be reduced to 0.215 and even 0.1613 cents per half kilo.

Remilling Industry

Remilling native rubber is an industry that was first started in Singapore by some Chinese and although Europeans later on also entered the business most of the native rubber continues to find its way to the Chinese factories. The largest of these was established in 1919 by Tan Kah Kee.

In 1924 his works had 70 mills and handled 80 tons of wet rubber per day, or about 2,000 tons per month. The second largest factory belongs to a Chinese also, Nee Soon, which had 40 mills in 1924. The best known remilling factory in the hands of Europeans is that of Firestone. The total number of remilling factories in Singapore is 200, including a large number of small establishments.

It was not until about 1923 that attempts were first made at remilling in the Dutch colonies. In the various native rubber growing districts in Sumatra the first works were on a very small scale. In Borneo it has been chiefly the Japanese who got hold of the new industry. Reliable figures regarding remilling in the Netherlands East Indies are not available before 1926. In that year there were at least 30 factories working with 146 mills and producing in all 6,083 tons of dry rubber—amber blanket and thin crepe. This was more than double that of 1925 and on the basis of this increase it is expected that the output during 1927 will prove to have been considerably greater. Of course, the industry of the Dutch colonies cannot be compared with that of Singapore. Figuring on a loss of 50 per cent in washing, we can take it that the 6,083 tons of finished rubber were produced from something like 12,000 tons of wet rubber, and as the total exports of native rubber in 1926 were 120,454 tons, including moisture and dirt, it will readily be seen that up to 1926 only a small fraction—10 per cent—of the total native wet rubber output stayed behind to be reworked, the rest going to Singapore.

Since the above data was collected several new concerns have become interested in the industry, notably the Rubber Union. Latest reports, however, show that these later establishments are not doing very well and several have had to stop operating. With the drop in rubber prices, it is expected that more will follow suit.

Mildew Characteristics

Mildew on Hevea has been known for years in East Java, but in West Java, up to last year, it was only observed on a few estates scattered here and there. When the disease became suddenly very widespread in 1927 and large numbers of estates were severely attacked, planters became alarmed, and now whenever there is any sign of leaf fall outside the regular wintering period, mildew is immediately thought of. Thus, the attacks of mites are frequently mistaken for mildew. Since it is important to recognize the disease in its earliest stages, Dr. Bobiloff has just published in the latest issue of the *Archief voor de Rubbercultuur* the chief characteristics of the disease.

A special feature of mildew is the abnormal leaf fall due to the attack of young leaves by *Oidium*. Unlike the attack of mites, which are found chiefly on young plants, mildew is met with on young leaves,

and also on half grown and fully grown leaves. The young leaves fall from the trees when attacked but the older ones remain partly or wholly attached to the trees. In the case of the older leaves the mildew is frequently noted on the upper surface of the leaves. The tissue underlying the points of attack degenerates and gives rise to yellow or brown spots, the latter consisting of dead or withered tissue. Mildew fungus has been observed on half-grown leaves even in the height of the West Monsoon which indicates that *Oidium* may be present on Hevea in a latent form during the West Monsoon only to infect the young leaves during the next wintering period.

Heavy Tapping

On the Tjiseroe estate a group of trees was tapped during three years with two cuts over half the circumference right up to the wood. At the same time, by way of comparison an equally large stand of trees was tapped in a normal manner with one cut over $\frac{1}{4}$ the circumference. Samples of rubber were taken from both groups and examined to determine what the effect of the heavy tapping was on the inner qualities of the rubber. It was found that the effect of overtapping was nowhere so noticeable as in the rubber content and the composition of the serum. The most striking feature of the serum was the abnormally high figure for the ash content, 25.5 and 25.6 against 14.9 and 16.4, clearly demonstrating the poor character of the latex from the overtapped area—a lack of organic substances, so that a more than normal quantity of mineral salts is taken up.

French Guiana

Figures concerning exports of balata from French Guiana covering the years 1898 to 1926 show a fairly steady development of the industry, overlooking minor fluctuations, until they reached their height in 1920. Beginning with the almost insignificant figure of 340 kilos in 1898, exports rapidly grew until in 1902 the amount was 11,359. The following year occurred the first set-back, when shipments fell to 4,343 kilos, to go back to 11,375 kilos in 1904. Thereafter, figures mount steadily until in 1909 another decline is noted to 16,759 kilos from 23,918 kilos in the preceding year.

In 1913, shipments make a big spurt ahead—from 70,175 kilos in 1912 to 217,982 kilos, and progress continues on the same scale till in 1920 the amount is 1,095,979 kilos. Since that year, however, the decline has been as rapid as the growth was, and 1926 ends with shipments aggregating only 194,833 kilos.

Washing Brazilian crude rubber continues in full swing, with shipments of 163 long tons of washed rubber to the United States in February. Plans are under way for the installation of a fourth washing plant in Brazil.

Rubber Patents, Trade Marks and Designs

Machinery Patents

United States

1,666,649. VULCANIZER. This is of the watch case type for use in connection with the manufacture of tires and tubes. The construction is such that it can be more conveniently operated than either the vertical or horizontal forms and a universal joint or connection compensates for inaccuracies of manufacture. A. H. Harris, Akron, O.

1,666,689. COLLAPSIBLE CORE. This device has for its object simplification of the means by which the tire core is expanded and collapsed. Also to so mount and move the key section as to expedite its movement in operation, provide for maximum clearance of the other movable sections in collapsing the core. Peter De Mattia, Passaic, assignor to De Mattia Brothers, Garfield, both in N. J.

1,667,009. LAMINATED STRIPS. This machine is particularly adapted for the manufacture of plied strips such as bead coverings in pneumatic tire construction. Sheet rubberized fabric is received, cut and plied by the machine which laminates the stock with the ends of the plies offset to permit splicing. G. L. Matthias, Cuyahoga Falls, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,667,263. TIRE BUILDING APPARATUS. This invention relates to the so-called pulley used in flat band tire construction. The pulley not only supports the tire band but serves as the base upon which the band is inflated into toric form by fluid pressure. G. L. Mather, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,668,032. VULCANIZER. The special function of this device is the vulcanization of the protective covering or tread part on to the prevulcanized tire casing. Water pressure is supplied independently of steam pressure so that it may be used in excess of the latter for the better union of the plies of the cured carcass. D. F. Wilhelmi, Doorwerth, Nether-

lands, assignor of one-half to Morgan & Wright, Chicago, Ill., and one half to The B. F. Goodrich Co., New York, N. Y.

1,668,037. MANIFOLDING SYSTEM FOR VULCANIZING. This invention provides a construction of manifold that may be coupled together easily and quickly so as not to hinder rapid loading of a press vulcanizer. A. O. Abbott, Jr., Detroit, Mich., assignor to Morgan & Wright, Chicago, Ill.

1,668,038. CUTTING AND WEIGHING STRIP MATERIAL. This machine first cuts and then weighs strips of rubber material. Either of these features may be eliminated to make the machine a cutting machine only or a weighing machine as may be desired. A. O. Abbott, Jr., and C. M. Sloman, Detroit, Mich., assignors to Morgan & Wright, Chicago, Ill.

1,668,555. STRETCHING DEVICE. This relates to a machine for stretching rubberized fabric. It is used in combination with a calender to apply tension to the goods by means of motor operated grip rolls. W. S. Freeburg, Milwaukee, Wis., assignor by mesne assignments, to The Fisk Rubber Co., Chicopee Falls, Mass.

1,669,397. TUBE TRIMMER. This is for trimming uncured rubber tubes to length upon the curing mandrels. Means are provided for making a true circular single cut and avoiding double or helical cuts. D. M. Lindsay, assignor to The Fisk Rubber Co., both of Chicopee Falls, Mass.

1,666,150. TIRE CASING SPREADER. J. P. Shevlin and S. E. Norton, Denver, Colo.

1,666,712. TUBE TESTER. G. E. Mancos, Richmond, Va.

1,666,998. REPAIR VULCANIZER. M. E. Faber, Waupun, Wis., assignor, by mesne assignments, to The Shaler Co., Wilmington, Del.

1,667,036. MOLD ENGRAVING MACHINE. A. P. Jahant, assignor to The Akron Standard Mold Co., both of Akron, O.

1,667,127. TIRE VULCANIZER. G. J. Mead,

Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.

1,667,129. MOLD ALINING MEANS. T. Midgley, Hampden, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

1,667,135. TIRE BUILDING MACHINE. G. F. Wikle, Milwaukee, Wis.

1,667,420. TESTING MACHINE. W. J. Kent, Brooklyn, N. Y., assignor to The Mechanical Rubber Co., Chicago, Ill.

1,667,527. APPARATUS FOR MANIPULATING FASTENERS AND TABS. V. H. Bodle, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,667,687. MOLD ENGRAVER. A. J. Fleiter and T. A. Miller, assignors to The Akron Standard Mold Co., all of Akron, O.

1,668,017. RETREAD MOLD. W. P. Hen-son, Sacramento, Calif.

1,668,214. DETREADING TIRE MACHINE. K. W. Liebau, Los Angeles, Calif.

Dominion of Canada

279,337 and 279,338 MIXER. The Farrel Birmingham Co., Inc., assignee of The Farrel Foundry & Machine Co., assignee of R. C. Lewis, all of Ansonia, Conn., U. S. A.

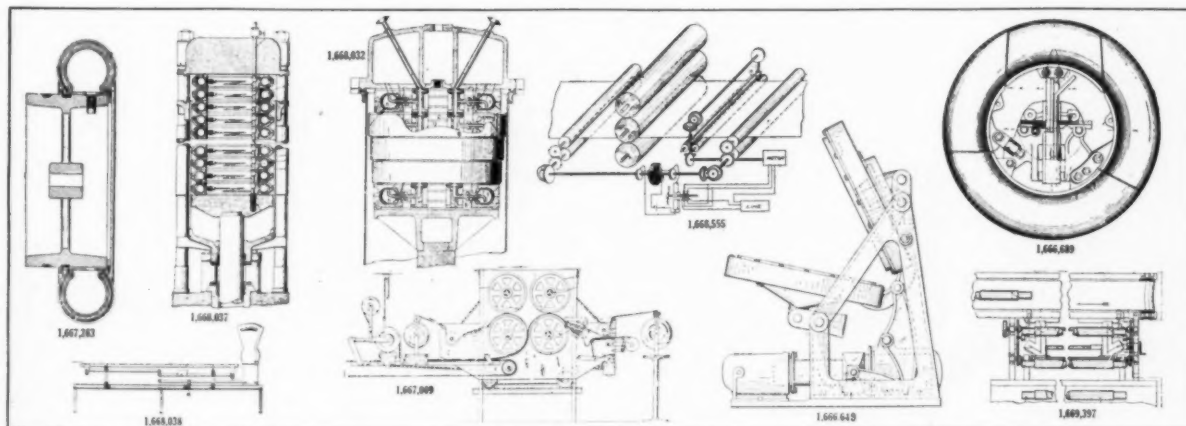
279,612 SLITTING MACHINE. The Cameron Machine Co., Brooklyn, N. Y., assignee of R. M. Johnstone, Roselle Park, N. J., both in the U. S. A.

279,983 CORD MACHINE. The Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of R. Truesdale, R. C. Smith and E. Simpson, Birmingham, County of Warwick, all in England.

279,998 TIRE MACHINE. The Goodyear Tire & Rubber Co., assignee of J. A. Shively, both of Akron, Ohio, U. S. A.

280,000 VULCANIZER. The Goodyear Tire & Rubber Co., assignee of W. F. Wirgman, Jr., and M. E. Tedrow, all of Akron, Ohio, U. S. A.

280,001 HEEL MACHINE. The Goodyear



Rubber Patents, Trade Marks and Designs

Tire & Rubber Co., assignee of L. Wetmore, both of Akron, Ohio, U. S. A.

United Kingdom

285,005† **ELECTRIC CALENDER GAGE.** Atlantic Precision Co., 80 Federal St., Boston, assignees of A. Allen, 16 Wildwood St., Winchester, both in Mass, U. S. A.

285,103 **VULCANIZER.** Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, H. Willshaw and T. Norcross, Fort Dunlop, Erdington, Birmingham.

285,359† **TIRE VULCANIZER.** B. F. Goodrich Co., 1780 Broadway, New York, N. Y., assignees of J. R. Gammeter, 680 North Portage Path, Akron, O., both in the U. S. A.

285,712 **MIXER.** L. Graffe, 15 Rue de l'Ouest, Neuilly-sur-Seine, France.

285,865† **TIRE VULCANIZER.** Akron Standard Mold Co., 1624 Englewood Ave., assignees of A. J. Fleiter, 894 West Exchange St., both of Akron, and H. C. Bostwick, 98 North 17th St., Kenmore, both in Ohio, U. S. A.

Designs

Germany

1,025,547 **TIRE PUMP.** Hasso Manzinger and Jakob Brandmeier, Ramsau bei Haag, Oberbay.

1,025,842 **SPRAYING MACHINE NOZZLE.** Eisenwerk Gebrüder Arndt G. m. b. H., Fennstrasse 21, Berlin N. 39.

Process

United States

1,666,232 **MOSAIC.** S. H. Boynton, Los Angeles, Calif.

1,666,234 **TIRE.** J. F. Cullen, Portland, Ore.

1,666,883 **TIRE.** H. M. Lambert, Portland, Ore., H. H. Lambert executrix of said H. M. Lambert, deceased.

1,668,390 **TUBE.** J. W. Auman, Racine, Wis.

1,668,782 **BLADDER.** F. T. Roberts, Yonkers, assignor to Paramount Rubber Consolidated, Inc., Tuckahoe, both in N. Y.

1,669,262 **TUBE.** C. E. Maynard, Northampton, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

Dominion of Canada

279,557 **MOLD.** H. C. Lord, Erie, Pa., U. S. A.

United Kingdom

285,113 **RUBBER ARTICLE.** Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, and G. W. Trobridge, Fort Dunlop, Erdington, Birmingham.

285,844† **TREATING LATEX.** Anode Rubber Co., Ltd., 10 Lefebvre St., Guernsey, assignees of Anode Rubber Co., Ltd., 15 Throgmorton Ave., London.

† Not yet accepted.

286,059 **TIRE.** Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, J. Healey, St. Mary's Mills, Leicester, and F. Shaw & Co., Ltd., Corbett Street Iron Works, Manchester.

286,066 **THREADS AND TAPES.** India Rubber, Gutta Percha & Telegraph Works Co., Ltd., 106 Cannon St., London, and E. J. Smith (known as E. J. Edgar) of India Rubber, Gutta Percha & Telegraph Works, Horninglow Rd., Burton-on-Trent.

286,242† **SURGICAL DRESSING.** D. Sarason, 17 Heinrich Hertzstrasse, Hamburg, Germany.

Chemical Patents

United States

1,667,853. **PAPER BACKING.** A backing for sheet rubber consisting of paper having a smooth even uniform coating of hard resin, a soft resin and a vegetable oil. G. E. Grimm, Springfield, assignor to Westfield River Paper Co., Russell, both in Mass.

1,667,854. **PAPER RUBBER SHEET PROCESS.** This process consists in surfacing paper with a smooth, uniform, even coating of water glass, dextrine, and glycerol in substantially the proportions of water glass 25 pounds, dextrine and glycerol one pound each and placing a relatively thick film of soft rubber thereon. G. E. Grimm, Springfield, assignor to Westfield River Paper Co., Russell, both in Mass.

1,668,235. **RUBBER COMPOSITION.** The reaction product of rubber and paratoluene sulphonic acid. H. L. Fisher, Leonia, N. J., assignor to The B. F. Goodrich Rubber Co., New York, N. Y.

1,668,236. **RUBBER COMPOSITION.** The product of the reaction, in the absence of a solvent, of sulphuric acid and rubber in proportion of the acid equivalent of from 2 to 25 parts by right of concentrated sulphuric acid, specific gravity 1.94, to 100 parts of rubber. H. L. Fisher, Leonia, N. J., assignor to The B. F. Goodrich Co., New York, N. Y.

1,668,237. **RUBBER COMPOSITION.** This comprises the products of the reaction under the influence of heat of rubber with a mixture of sulphuric acid and paratoluene sulphonic acid. H. L. Fisher, Leonia, N. J., assignor to The B. F. Goodrich Co., New York, N. Y.

1,668,439. **ABRASIVE ARTICLE.** An abrasive article composed of granules of abrasive material bonded together by films of gelled latex rubber containing a minor amount of distributed asbestos fiber. W. B. Westcott, assignor to Rubber Latex Research Corp., both of Boston, Mass.

1,668,475 and 1,668,476. **ABRASIVE ARTICLE AND PROCESS OF MANUFACTURE.** W. B. Westcott, Quincy, assignor to Rubber Latex Research Corp., Boston, both in Mass.

1,668,879. **RUBBER DISPERSION PROCESS.** This comprises forming a dispersion of a hydrophilic colloid and rubber in the

continuous phase, and thereafter inverting the phase of the dispersion by bringing the hydrophilic colloid into the continuous phase. H. L. Trumbull, Hudson, O., and J. B. Dickson, Northampton, Mass., assignors to The B. F. Goodrich Co., New York, N. Y.

1,669,242. **ACCELERATOR.** Method of making phenyl-ortho-tolyl-guanadine. R. V. Heuser, Portsmouth, N. H., assignor, by mesne assignments to A. C. Burrage, Boston, Mass.

Dominion of Canada

279,514. **RUBBER COMPOSITION.** A process of liquifying rubber by distilling it with a solvent and condensing the vapors. H. P. Butler, New York, N. Y., U. S. A.

279,628. **INSULATING PAPER.** Paper comprising rosin sized hydrated cotton fiber, rubber and a protective colloid including an acetylated starch. The Dominion Rubber Co., Ltd., Montreal, Canada, assignee of R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in L. I., N. Y., U. S. A.

279,878 **CAOUTCHOUC-LIKE PRODUCT.** An elastic rubber-like body produced by causing a sulphureting substance to react by way of polymerization in presence of a solvent upon ethylene-dichloride. Jean Baer, Basel, Switzerland.

United Kingdom

285,071† **RUBBER POLYMERS, OXIDES AND HALIDES.** Goodyear Tire & Rubber Co., 1144 East Market st., assignees of H. A. Bruison, both of Akron, O., U. S. A.

285,938. **MAKING DIPPED GOODS.** The mold is first coated with gelatine, etc., containing a coagulant such as sodium silico fluoride, acetic acid, or a salt of calcium, magnesium, zinc or aluminum. The mold may be porous or perforated and filled with a solution or jelly containing the coagulant. The mold or bath is agitated to make the deposit more uniform. Dunlop Rubber Co., Ltd., 32 Osnaburgh st., London, and D. F. Twiss, Fort Dunlop, Erdington, Birmingham.

286,171. **RUBBER ANTI-AGING MATERIAL.** This is obtained by extracting the phenolic constituents and aromatic bases contained in coal tar or the distillates from such tars from which any undesirable light oils have been removed. G. Fessel, 14 Robert Franz Strasse and Technische Chemikalien Co., 1, Merseburger Strasse, both in Halle-on-Sale, Germany.

286,272† **SYNTHETIC RUBBER PROCESS.** Polymerization of appropriate hydrocarbons such as isoprene, butadiene and dimethyl-butadiene is effected in an aqueous colloidal solution or suspension containing one or more electrolytes. I. G. Farbenindustrie A. G., Frankfurt-on-Main, Germany.

286,288†. **ANTI-OXIDANT.** The reaction product of an aldehyde and an amine which product is formed in the cold and is substantially a non-accelerator of vulcanization. Goodyear Tire & Rubber Co., Akron, assignees of L. B. Sebrell, Cuyahoga, both in Akron, O., U. S. A.

286,396. **WATERPROOFING PROCESS.** This consists in converting rubber, collodin or other material insoluble in water into an emulsion. After impregnating leather, wood, paper, fabrics, etc., with this emulsion it is converted into insoluble form by means of a fixing agent containing a metallic salt such as alum, aluminum acetate, or chrome alum. A. Jeremias, 23 Sophienstrasse, Stuttgart, Germany.

Rubber Patents, Trade Marks and Designs

Germany

458,716 RECLAIMING. Dr. Waldemar Scheithauer, Naumburg a. d. Saale.

General

United States

April 17, 1928*

- 1,666,098 BATHING CAP. G. P. Kaul, Detroit, Mich.
 1,666,155 TIRE SIGNAL. L. H. Unglesby, assignor of one half to M. H. Hughes, both of Baton Rouge, La.
 1,666,197 SYRINGE. A. Dolmatch, Bayonne, N. J.
 1,666,220 TELEPHONE MUFFLER. G. W. Schultz, Bowers, Pa.
 1,666,283 TIRE INFLATOR. G. E. Farley, assignor to Service Equipment Co., both of Southgate, Calif.
 1,666,325 WOVEN ELASTIC FABRIC. L. B. Chisholm, Melrose, assignor to Everlastik, Inc., Chelsea, both in Mass.
 1,666,562 TIRE VALVE. J. P. Gits, Chicago, Ill.
 1,666,603 HEEL. P. H. Letchford, Winnipeg, Manitoba, Canada.
 1,666,684 DOUCHE. H. H. Carstens, Oak Park, assignor to H. Carstens Mfg. Co., Chicago, both in Ill.
 1,666,686 FABRIC. L. B. Chisholm, Melrose, assignor to Everlastik, Inc., Chelsea, both in Mass.
 1,666,699 GOLF BALL. W. Hagen, assignor to L. A. Young Co., both of Detroit, Mich.
 1,666,772 NIPPLE. T. and G. Campobasso, Barre, Vt.
 1,666,787 PRESSURE GAGE. A. J. Michelin, Paris, assignor to Michelin et Cie., Clermont-Ferrand, both in France.
 1,666,823 GARTER. D. B. Jacobs, Salt Lake City, Utah.
 1,666,846 KNEE PAD. D. S. Cooper, Abilene, Tex.
 1,666,863 TIRE PATCH. M. C. Myers, Tenino, Wash.

April 24, 1928*

- 1,666,938 BOWLING ALLEY MAT. F. Ksellmann, Akron, O.
 1,667,088 BALL. A. J. Turner, assignor to Wilson Western Sporting Goods Co., both of Chicago, Ill.
 1,667,123 TOY. K. Koller, Los Angeles, Calif.
 1,667,159 SHOE. G. A. Jones, assignor to Shoe Products, Inc., both of Lynn, Mass.
 1,667,386 HEEL. M. B. Ketcham, Ridgewood, N. J.
 1,667,414 LIFE PRESERVER. C. W. Breninger, Canton, O.
 1,667,535 TIRE. W. E. Celestin, New York, N. Y.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

1,667,594 VALVE STEM ATTACHMENT. F. H. Gibbons, Russell, N. Y.

1,667,707 GARTER. N. Cherniak, Bronx, N. Y.

May 1, 1928*

- 1,667,711 CASING FILLER. J. Allegre, Tuolumne, Calif.
 1,667,912 RAFT. C. D. Vlahon, Spokane, Wash.
 1,667,939 HEEL. M. Levy, New York, N. Y.
 1,668,134 COUPLING. R. C. Wilson, assignor to International Motor Co., both of New York, N. Y.
 1,668,143 BALL. W. F. Daasch, Davenport, Ia.
 1,668,173 BALL. M. Scudder, assignor to Rawlings Mfg. Co., both of St. Louis, Mo.
 1,668,178 SPRING SHACKLE. R. A. Weinhardt, assignor to Packard Motor Car Co., both of Detroit, Mich.
 1,668,194 TYPEWRITER PLATEN. C. T. Dickey, Elizabeth, N. J.
 1,668,227 NIPPLE. R. G. A. Beck, Montreal, Quebec, Canada.
 1,668,398 TIRE VALVE. T. Erismann, Bonn, Germany.
 1,668,438 TUBE CLEANING PLUG. H. T. Weis, Fairmont, W. Va.
 1,668,461 GARTER. L. K. Morrison, Decatur, Ga.
 1,668,481 SHOE STRAP. F. A. Ballou, Nyatt, and R. T. Stafford, East Providence, assignors to B. A. Ballou & Co., Inc., Providence, all in R. I.

May 8, 1928*

- 1,668,560 HOSE. L. J. D. Healy, Milwaukee, Wis., assignor to The Fisk Rubber Co., Chicopee Falls, Mass.
 1,668,663 TIRE GAGE. E. Vahle, Union City, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
 1,668,681 COUPLER. O. M. Kirlin, Watertown, S. Dak.
 1,668,743 ABDOMINAL APPLIANCE. F. J. Stuart, St. Louis, Mo.
 1,668,753 TIRE GAGE. I. J. Baker, Latty, O.
 1,668,785 TOY. L. L. Smart, Yonkers, assignor to Paramount Rubber Consolidated Inc., Tuckahoe, both in N. Y.
 1,668,803 FLUSH TANK BULB. F. A. Cigol, Paterson, N. J., and F. T. Roberts, Yonkers, assignors to Paramount Rubber Consolidated Inc., Tuckahoe, both in N. Y.
 1,668,821 MEANS FOR SIGNALING TIRE DEFLATION. W. L. Rice, Denver, Colo.
 1,668,980 HEEL. G. H. Schmidt, Alhambra, Calif.
 1,669,010 SWIMMING GLOVE. F. Natho, Oppenheim, Germany.
 1,669,173 TIRE BEAD. R. C. Pierce, assignor to National Standard Co., both of Niles, Mich.
 1,669,176 TIRE. J. B. Roberts, Parker, Ariz.
 1,669,206 TIRE VALVE. E. V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.

1,669,212 TENNIS RACKET STRING. G. P. Schilz, Brooklyn, N. Y.

1,669,221 BALL. A. J. Turner, assignor to Wilson Western Sporting Goods Co., both of Chicago, Ill.

Dominion of Canada

April 10, 1928

279,245 WATER BAG HEATER. M. C. Levinson, Long Beach, Calif., U. S. A.

April 17, 1928

- 279,382 TIRE. P. P. Kostock, Chicago, Ill., U. S. A.
 279,415 RULER. W. Upton, South Bank-on-Tees, County of York, England.
 279,431 JOINT PACKING. The Beldam Packing & Rubber Co., Ltd., London, E. C. 3, assignee of G. W. Beldam and J. Smith, Ealing, County of Middlesex, both in England.

April 24, 1928

- 279,511 TEAT CUP. O. A. Bruun, Frederiksberg near Copenhagen, Denmark.
 279,538 SHOE. F. J. Gross, Auburn, Me., U. S. A.
 279,571 TIRE VALVE. C. S. Preston, San Diego, Calif., U. S. A.
 279,592 CORSET. O. C. Wiese, Newton, Mass., U. S. A.

May 1, 1928

279,836 RUNNING BOARD. The Ohio Rubber & Textile Co., Cleveland, assignee of B. Bronson, Lakewood, both in Ohio, U. S. A.

May 8, 1928

- 279,919 STAIR TREAD. J. H. Maher, Montreal, Quebec.
 279,920 WEATHER STRIP. D. T. Main, Westmount, Quebec.
 279,999 FLEXIBLE CONDUIT. The Good-year Tire & Rubber Co., assignee of E. G. Kimmich, both of Akron, Ohio, U. S. A.

United Kingdom

April 4, 1928

- 285,168 TIRE. E. B. Killen, 27 Queen Victoria St., London.
 285,193 HOT WATER BOTTLE. J. Knopf, 37 Royal Crescent, Notting Hill, London.
 285,203 ROAD. J. J. Horne, 3 Queen Victoria St., and C. F. Hendrick, 119 Wilton Rd., both in London.
 285,233 TEAT CUP. G. H. Gascoigne, Lyndford House, Castle St., Reading.
 285,250 HEEL. L. Frankland, 42 Keswick St., Elwick Rd., West Hartlepool, Co. Durham.
 285,302 CARD CLOTH. W. Otto, 12 Dohlerstrasse, Leisnig, Saxony, Germany.
 285,345 HEEL. P. H. Letchford, 425 Agnes St., Winnipeg, Canada.

April 12, 1928

- 285,348 HEEL. Exopa Patentverwertungs Akt.-Ges., 1 Stampfenbachplatz, Zurich, Switzerland.
 285,381† DRIVING BELT. B. F. Goodrich Co., 1780 Broadway, New York, N. Y., assignees of H. W. Dalzell, 155 Mayfield Ave., Akron, O., both in the U. S. A.
 285,397† MESSAGE ROLLER. G. Sick, 10 Avenue du Simplon, Lausanne, Switzerland.

Rubber Patents, Trade Marks and Designs

- 285,523 HORSESHOE. W. H. T. Mounsey, Kings Villas, Sedbergh, Yorkshire.
285,575 ROLLER. C. H. Gray, 106 Cannon St., London.

April 18, 1928

- 285,635 TIRE. A. V. Mellano, 6 Queens Drive, Thames Ditton, Surrey.
285,717 TIRE. J. Rushworth, 22 Lisvane St., Cathays, Cardiff.
285,768 HEEL. E. Balke, 14 Wokrenterstrasse, Rostock, Germany.
285,781 MASSAGE ROLLER. A. Jacobi, 82 Bülowstrasse, Berlin, Germany.
285,986 ELASTIC WEBBING. S. Sokal, 1 Great James St., Bedford Row, London. (Thoren, Reichert & Co., Akt.-Ges., Schwelm, Germany.)

April 25, 1928

- 286,100 TIRE. J. Y. Johnson, 47 Lincoln's Inn Fields, London. (Semple-Lee Processes Inc., Permanent Title Bldg., Mill St., Akron, Ohio, U. S. A.)
286,132 ARCH SUPPORT. H. R. Levick, 132 South Limestone St., Lexington, Ky., U. S. A.
286,168 PAVING BLOCK. M. Holmes, 49 Deansgate, Manchester.
286,267† EAR INSTRUMENT. L. Santi, 8 Rue du Jeune Anarchis, Marseilles, France.
286,363 VALVE. P. M. Salerni, Virgilina, Eze, Alpes Maritimes, France.

† Not yet accepted.

Germany

- 458,916 COVER FOR WRIST WATCHES. Clara Lesage, nee Reich, Brand-Erbisdorf, Sa.

Design

Germany

- 1,025,448 STOCKING PROTECTOR. Joh. O. Fette, In der Runken 8, Bremen.
1,025,556 TUBE PROTECTION. Richard Haschel, Pirna a. d. Elbe.
1,025,606 STOCKING. Auguste Bertram, Französische Strasse 49, Berlin W. 8.
1,026,040 BUFFER FOR STRETCHERS. Max Schulze, Cassiusgraben 9, Bonn.
1,026,244 TIRE COVER. Michelin & Cie., Clermont-Ferrand, France. Represented by H. Hillecke, Berlin S. W. 61.
1,026,301 AIR CUSHION. Continental Caoutchouc und Gutta-Percha Compagnie, Hanover.
1,026,348 HEEL AND SOLE CUSHION. Erich Naumann, Radeberg i. S.
1,027,013 BRAIDED HOSE. Sanatola Gesellschaft Pohl & Co., Oranienstrasse 117-118, Berlin S. W. 68.
1,027,038 BOOK PROTECTOR. Karl Brune, Hermannstrasse 13, Düsseldorf.
1,027,097 TABLE MAT. Richard Zollich, Gerbstadt, Bez. Halle a. d. S.
1,028,332 SCRUBBER. Gustav Grabosch, Waldemarstrasse 29, Berlin, S. O. 36.
1,028,420 STAMP. Johann Weitfeld, Radbod.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b) are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

April 17, 1928

Act of February 20, 1905

- 241,030 TAXI—boots, shoes, overshoes and rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
241,031 RAYNETTS—overshoes. Cambridge Rubber Co., Cambridge, Mass.
241,051 AIRWAY—tire and inner tube. The Firestone Tire & Rubber Co., Akron, O.
241,052 SUPERFLEX—tire casing. Dickinson Cord Tire Corp., Nutley, N. J.
241,115 Portrait set in fancy design at the side of which are the words: "HAINES THE SHOE WIZARD"—shoes made of leather, rubber or canvas. Haines Shoe Co., York, Pa.
241,122 IDLEWILD—boots, shoes, overshoes, rubber-soled canvas shoes. Hood Rubber Co., Watertown, Mass.
241,124 Portrait surrounded by the words: "HAINES," "ONE," "TWO," "THREE," "THAT'S ALL"—shoes made of leather, rubber or canvas. Mahlon N. Haines, York, Pa.
241,169 NAVIGATOR—rubber clothing. Excello Rubber Co., Inc., New York, N. Y.
241,177 Oval containing the words: "MUNROE BODY BALANCED REGISTERED SHOE"—boots, shoes and slippers made of leather, rubber, canvas, etc. The Munroe Shoe Co., Inc., Auburn, Me.
241,197 APASCO—golf balls. Apasco Purchase & Sales Corp., New York, N. Y.
241,215 Word: "EYNARD" with diamond drawn at side—Chirurgical instruments made of gum and rubber. J. Eynard & Cie., Paris, France.

Act of March 19, 1920

- 241,250 FOOT DEVELOPER—shoes of canvas, rubber, etc. Glaser Shoe Co., San Francisco, Calif.
241,266 PEERLESS—hose protector. Leon Lyons, doing business as Lyons Hose Protector Co., Omaha, Nebr.
241,267 MARINETTE—clothing. Excello Rubber Co., Inc., New York, N. Y.

April 24, 1928

Act of February 20, 1905

- 241,276 Representation of an inner tube across the front of which are superimposed the words: "RED CROWN"; below the tube a representation of a cushion

on which rests a crown—tire tube patches. Harry Saunders, doing business as Red Crown Patch Co., Menominee, Mich.

- 241,417 SUPERIOR—type, printing outfits, etc. The Superior Type Co., Chicago, Ill.

May 1, 1928

Act of February 20, 1905

- 241,629 Representation of an eraser on one side of which is a green circle—typewriter erasers. American Lead Pencil Co., New York, N. Y.
241,638 VARNESIA—auto top, cushion, tire and leather dressing. G. H. Helt, Atlantic, Mass.
241,639 SARCOLITHIC—mineral rubber pavements. Asphalt Products Co., Chicago, Ill.
241,650 ROYLAND—patches and patching outfits. Morris Miller, New York, N. Y.

May 8, 1928

Act of February 20, 1905

- 241,710 Representation of a belt on the buckle of which are the words: "RED BELT"—auto tube patches. Red Belt Patch Co., Jacksonville, Fla.
241,753 SPUR—suspenders. Hewes & Potter, Inc., Boston, Mass.
241,756 GAB-TEX—raincoats. The Mandelberg Co., Inc., New York, N. Y.
241,793 JAY BEE—shoes of leather, rubber, fabric, etc. Berland's Shoe Stores, Inc., St. Louis, Mo.
241,803 SPUR—garters. Hewes & Potter, Inc., Boston, Mass.
241,820 Oval containing the words: "QUALITY," "CASSCO," "PHILADELPHIA," "SERVICE"—insulating tape, etc. Philip Cass, doing business as Philip Cass & Co., Philadelphia, Pa.
241,821 NORTHEAST—rubber cases, etc. Northeast Battery Co., Inc., Boston, Mass.
241,929 AERO-X—chemical compounds for use in accelerating the vulcanization of rubber. American Cyanamid Co., New York, N. Y.
241,936 STABILITE—chemical substances used as age resistants and anti-oxidants in compounding rubber. C. P. Hall, doing business as The C. P. Hall Co., Akron, O.
241,999 BONNIE BOUNCER—sponge rubber balls. The Sponge Rubber Products Co., Derby, Conn.

United Kingdom

April 4, 1928

- 486,802 Shield enclosed within a square and containing the words: "THE CLIMATIC," "RAINCOAT," "A SHIELD FOR ALL WEATHERS"—raincoats. Northcote, Brewer & Co., Ltd., 11, Mason St., Manchester.
487,587 REXOVAL—tires and inner tubes. E. B. Killen, 27, Queen Victoria St., London, E. C. 4.
487,588 REX-OVAL—tires and inner tubes. E. B. Killen, 27, Queen Victoria St., London, E. C. 4.
487,953 MAXPLAY—sport goods. The Dunlop Rubber Co., Ltd., Fort Dunlop, Holly Lane, Erdington, Birmingham.

Rubber Patents, Trade Marks and Designs

April 11, 1928

489,059 GABERTEX—showerproof, rainproof and waterproof garments. J. Mandleberg & Co., Ltd., Albion Works, Cobden St., Pendleton, Manchester.

April 18, 1928

476,474 Oval containing the words: "ESTABLISHED," "MACINTOSH," "1824"—tires. Charles Macintosh & Co., Ltd., 2, Cambridge St., Manchester.

488,948 "CRITERION CORDS"—rubber and gutta percha goods. The Marsham Tyre Co., Ltd., 48, Charlotte St., Tottenham Court Rd., London, W. 1.

489,163 Representation of a dog's head, above the representation the word: "Mastiff"; beneath the representation the word: "CORDS"—rubber and gutta percha goods. The Marsham Tyre Co., Ltd., 48, Charlotte St., Tottenham Court Rd., London, W. 1.

489,282 VALSTAR—showerproof, rainproof and waterproof garments. J. Mandleberg & Co., Ltd., Albion Works, Cobden St., Pendleton, Manchester.

April 25, 1928

B487,175 SHOCKSTOPS—handle grips. Universal Rubber Pavoirs (Manchester 1923), Ltd., Chatham St. Rubber Works, Canning St., Audenshaw, near Manchester.

488,228 Man's figure beneath which are the words: "JOHN BULL"—rubber and gutta percha goods. The Leicester Rubber Co., Ltd., Evington Valley Mills, Evington Valley Rd., Leicester.

Labels

United States

33,842, 33,843 and 33,844 THUNDERBOLT. Tire patches. F. J. Hagerling, St. Louis, Mo. Published Feb. 15, 1928.

33,871 SUPER SERVICE. Tire plaster

patches. Super Service Corp., Omaha, Nebr. Published Dec. 15, 1926.

Designs

United States

74,929 TIRE. Term 14 years. R. H. Keaton, San Francisco, Calif.

Dominion of Canada

7,910 NURSING BOTTLE NIPPLE. R. G. A. Beck, Montreal, Quebec.

7,911 SOLES AND HEELS OF FOOTWEAR. Dominion Rubber Co., Ltd., Montreal, Quebec.

7,913 TIRE. The Goodyear Tire & Rubber Co. of Canada, Ltd. New Toronto, Ontario.

Prints

United States

10,794 VA-CAR TIRE PLASTER. Tire patches. Virginia-Carolina Rubber Co., Inc., Richmond, Va. Published Feb. 1, 1928.

Gastex

A new carbon black, known as Gastex, is now being offered as a reinforcing pigment for rubber compounding. It does not retard the cure and contributes superior aging quality to rubber stocks. Gastex is produced from natural gas by a new process developed by one of the largest producers of natural gas. The yield from this process permits the black to be offered at very attractive prices. It is made in a single plant and is very uniform in quality. In physical properties it differs somewhat from ordinary channel blacks. This difference together with its shorter rate of cure in rubber necessitates some readjustment of mixing formulas and cures.

Dr. Pirelli Speaks on International Questions

Dr. Alberto Pirelli of Pirelli, Milan, Italy, rubber manufacturer, who is also president of the International Chamber of Commerce, spoke at the United States Chamber of Commerce dinner held in Washington, D. C., May 10, 1928.

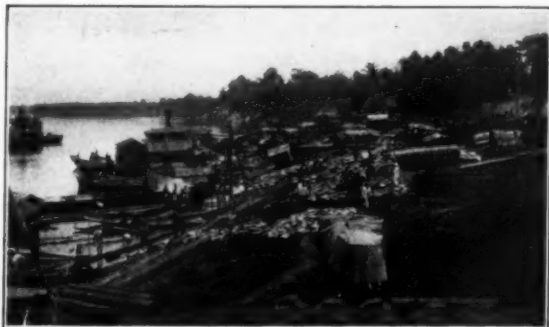
The declaration that new economic forces are in action and that the United



Dr. Alberto Pirelli

States can go on lending money abroad is a cogent argument, yet, declared Dr. Pirelli, the question arises: "If the United States continues lending money abroad at the present rate of a billion and a half dollars annually, and if in addition to this amount they reinvest abroad the interest accruing on previous loans and investments, the total credit from the rest of the world may reach in a comparatively few years so large an amount that some claim the liquidation of the balance may be on a scale out of proportion to the volume of world trade.

"I mean by this," continued the speaker, "what will happen if the interest accruing yearly on loans and investments, plus the annuities on war debts, reaches the incredible sum of three or four billion dollars—can that be taken care of without alteration in the situation of the visible trade balance? I have an open mind and am not unduly pessimistic regarding this situation, but by raising the question I wish to bring to your attention possible contingencies which have already aroused very great discussion."



Fred Waterhouse & Co., Ltd

This is Djambi Town in Sumatra. Note piles of sand in foreground of the picture which is put into the native rubber to gain weight.

Rubber Scrap Market

The rubber scrap demand continues very active for domestic consumption. Scrap accumulations just about meet the requirements, leaving no wide margin of stocks. The drop in crude rubber prices has effected reductions in scrap particularly in boots and shoes, hard rubber, inner tubes and tires.

Mechanical, airbrake hose and mixed black scrap remain at normal price levels.

Solid tires are not being offered because the price is too low to permit the expense of removing them from their rims. They are being offered only by those dealers with whom the urgency of selling is acute.

New York Quotations for Carload Lots

May 25, 1928

Boots and Shoes

Boots and shoes, black.....lb.	\$0.01¼ @ \$0.01¾
Red and white.....lb.	.00½ @ .00¾
Trimmed arctics, black.....lb.	.00½ @ .00¾
Untrimmed arctics.....lb.	.00½ @ .00¾
Tennis shoes and soles.....lb.	.00¾ @ .01

Hard Rubber

No. 1 hard rubber.....lb.	.06 @ .07½
Battery jars, black compound.....lb.	.01 @ .01½

Inner Tubes

No. 1, floating.....lb.	.06½ @ .07
No. 2, compounded.....lb.	.03½ @ .03¾
Red.....lb.	.04¾ @ .05
Mixed tubes.....lb.	.03½ @ .03¾

Mechanicals

Mixed black scrap.....lb.	.00½ @ .00¾
Heels.....lb.	.00½ @ .00¾
Hose, air brake.....ton	20.00 @ 25.00
regular soft.....ton	15.00 @ 16.50
No. 1 red.....lb.	.02 @ .02½
No. 2 red.....lb.	.01 @ .01½
White, druggists' sundries.....lb.	.02½ @ .03
Mechanical.....lb.	.01½ @ .01¾

Tires

Pneumatic Standard—		
Mixed auto tires with beads.....ton	20.00 @ 21.50	
Beadless.....ton	29.00 @ 30.00	
White auto tires with beads.....ton	40.00 @ 42.00	
Beadless.....ton	50.00 @ 52.00	
Mixed auto peelings.....ton	32.00 @ 34.00	
Solid—		
Mixed motor truck, clean.....ton	20.00 @	

United States Tire Fabric Exports, 1927

	Tire Fabrics		Others	
	Sq. Yds.	Value	Sq. Yds.	Value
Austria.....	10,984	\$4,888		
France.....	2,053	\$789		
Germany.....			3,867	\$3,200
Sweden.....	46,473	16,002	2,754	729
United Kingdom.....	1,068,106	472,373	117,785	33,456
Canada.....	1,375,434	459,619	1,036,790	242,206
British Honduras.....			1,144	337
Nicaragua.....			66	34
Panama.....	18	23	4,117	1,764
Salvador.....	253	72		
Mexico.....	20,207	10,401	4,349	1,408
Jamaica.....			313	347
Other British West Indies.....			459	156
Cuba.....			1,094	290
Dominican Republic.....			375	201
Virgin Islands of U. S.....			436	45
Argentina.....	459	431		
Bolivia.....			7,291	1,741
British Malaya.....	9,612	5,087	19,504	3,919
China.....			10	40
Hong Kong.....			480	65
Siam.....				
Australia.....	930,854	441,613	309,679	97,393
French Oceania.....	28	25		
British South Africa.....			206	164
Canary Islands.....			2,800	800
Total.....	3,453,548	\$1,406,469	1,524,503	\$393,183

ESTIMATE EXPORTS OF AUTOMOBILE CASINGS FROM MANUFACTURING COUNTRIES DURING 1927 ARE AS FOLLOWS: United States, 2,811,000; Canada, 1,679,000; France, 2,112,000; Italy, 726,000; United Kingdom, 893,000; Germany, 154,000; Japan, 165,000; and Belgium, 296,000.

Statistics Compiled from Questionnaire¹ Covering the First Quarter of 1928

RECLAIMED RUBBER	Long Tons			
	Inventory at End of Quarter	Production	Shipments	Consumption
Reclaimers solely (7).....	4,028	19,623	20,986	.....
Manufacturers who also reclaim (23).....	6,988	31,489	11,506	23,164
Other manufacturers (78).....	5,301	.....	.....	16,756
Totals.....	16,317	51,112	32,492	39,920

SCRAP RUBBER	Long Tons		
	Inventory	Consumption	Due on Contract
Reclaimers solely (7).....	39,279	35,480	11,585
Manufacturers who also reclaim (20).....	21,394	28,589	14,079
Other manufacturers (17).....	626	.....	.....
Totals.....	61,299	64,069	25,664

NUMBER OF TONS OF CRUDE RUBBER CONSUMED IN THE MANUFACTURE OF RUBBER PRODUCTS AND TOTAL SALES VALUE OF SHIPMENTS OF MANUFACTURED RUBBER PRODUCTS

Products	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Tires and Tire Sundries:		
Automobile and motor truck pneumatic casings.....	62,036	\$143,640,000
Automobile and motor truck pneumatic tubes.....	13,981	22,979,000
Motorcycle tires (casings and tubes).....	105	452,000
Bicycle tires (single tubes, casings and tubes).....	231	561,000
Aeroplane casings and tubes.....	12	146,000
Solid and cushion tires.....	2,925	6,157,000
All other solid tires.....	135	545,000
Tire sundries and repair materials.....	1,446	5,135,000
Totals.....	80,871	\$179,615,000

Products	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Other Rubber Products:		
Mechanical rubber goods.....	4,472	\$26,194,000
Boots and shoes.....	4,305	19,611,000
Insulated wire and insulating compounds.....	796	8,404,000
Druggists' sundries, medical, surgical rubber goods.....	309	1,774,000
Stationers' rubber goods.....	343	755,000
Bathing apparel.....	253	600,000
Rubber clothing.....	354	1,839,000
Automobile fabrics.....	272	2,516,000
Other rubberized fabrics.....	252	1,208,000
Hard rubber goods.....	251	1,551,000
Heels and soles.....	1,412	6,088,000
Rubber flooring.....	215	1,108,000
Sporting goods, toys and novelties.....	357	1,840,000
Miscellaneous, not included in any of the above items.....	811	3,824,000
Totals.....	14,402	\$77,312,000
Grand totals—all products.....	95,273	\$256,927,000

INVENTORY OF CRUDE RUBBER IN THE UNITED STATES AND AFLOAT FOR UNITED STATES PORTS

	Long Tons			
	Plantation	Para	All Other	Totals
ON HAND				
Manufacturers.....	83,899	2,855	4,946	91,700
Importers and dealers.....	18,561	1,233	609	20,403
Totals on hand.....	102,460	4,088	5,555	112,103
AFLOAT				
Manufacturers.....	10,825	67	708	11,600
Importers and dealers.....	23,041	856	75	23,972
Totals afloat.....	33,866	923	783	35,572

¹Number of rubber manufacturers that reported data was 170; crude rubber importers and dealers, 44; reclaimers (solely), 7; total daily average number of employees on basis of third week of January, 1928, was 159,878.

It is estimated that the crude rubber consumption figures are 92 per cent of the total, and the crude rubber inventory 95 per cent of the total for the entire industry.

When Rubber Mold Quickens

Comparatively little deterioration, according to Dr. Otto de Vries, may occur through mold in crude rubber within two years; but in rubber under moldiness for five years a decided increase in slope and a decrease in tensile strength have been noticed. Vulcanizing time also increases 25 per cent or more, and the rubber's keeping quality declines steadily.

Review of the Crude Rubber Market

The Rubber Exchange of New York, Inc.

TRANSACTIONS on the Rubber Exchange from April 25 to May 23 inclusive were 16,495 lots, equivalent to 41,237½ tons. This turnover compares with 18,620 lots, or 66,550 tons done from March 23 to April 27, inclusive. May 25 spot closed at 19.20 cents.

Trading May 1 was small in volume, 490 lots. Spot price of smoked ribs closed at 17.3 cents, 10 points above the previous close. Factory and dealer absorption was in evidence and selling pressure at a minimum. Throughout the month a steady upward tendency was evident, May position advancing 2 cents a pound up to 18.8 cents on May 25.

Summarized by weeks the market exhibited the following features: At the end of the week closed April 28 the whole week's operations were marked by a steady undertone. It was the natural reaction of the industry after the severe jolt caused on all sides by the sharp decline of two weeks earlier. Time was necessary before normal market activity could be resumed. Belief was expressed that closer cooperation will ultimately be reached between the British and Dutch producers on the one hand and American consumers on the other.

The market of the week ended May 5 was exceedingly strong. A quick selling movement followed the announced abolition of restriction. The market shortly steadied itself and the value of rubber was scrutinized by buyers, sellers and consumers while waiting for evidence of steadiness to develop.

The week ended May 12 was quiet with steady undertone. Factory interest lessened and selling pressure was absent.

The week terminated May 19 the market was very quiet and there was little or no selling pressure and prices eased off slightly due to lack of interest. This was attributed to uncertainty current in the tire industry.

Prices reached a level at which constant pressure stopped and consumers were buying freely. The market during the last week of the month was steady and prices firm. Spot ribs were quoted 19.30 on May 26.

George H. McFadden & Bro., New York, N. Y., reviewing the market of the week ended May 19 said: In view of the fact that stocks in other centers have also shrunk in even greater proportions we feel that further reductions in the visible supplies should be viewed with a certain amount of apprehension, particularly in view of the fact that at these low prices a greater consumption of the article can be expected than has been forecasted heretofore. Moreover, a considerable quantity of spot rubber will naturally have to be held in reserve in such important trading centers as London, New York, Singapore, etc., for the purpose of safeguarding trade or speculative transactions, and therefore probably the major portion of these present visible stocks can be definitely considered as unavailable for consumption, particularly at the present low prices. An improvement in prices is more likely than a further decline.

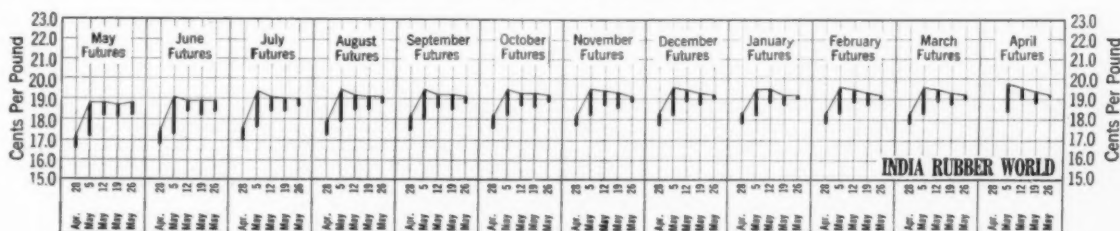
By-Law Amendments

The Board of Governors of the Rubber Exchange is considering proposed amendments to the by-laws which provide for trading in a second contract covering two additional grades of rubber, namely amber crepe and browns. If adopted, the amendment will greatly increase the trading volume on the exchange.

The annual production of amber crepes and browns is estimated at 150,000 tons and the tire manufacturers are the largest users of these as they are standard grades. Amber grades are the native production of the East which is brought into Singapore wet and unfit for export. It is washed and cleansed by the mills and is then known as amber crepe.

The adoption of the proposed amendment would mean that the Rubber Exchange could trade in approximately 95 per cent of the grades of crude rubber used by American manufacturers.

New York Rubber Exchange—High and Low Monthly Futures



The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLOSING PRICES—CENTS PER POUND

	April							May																				
1928	23	24	25	26	27	28	30	1	2	3	4	5	7	8	9	10	11	12	14	15	16	17	18	19	21	22	23	24
April	16.3	16.3																										
May	16.6	16.6	17.0	17.0	17.0	17.2	17.2	17.2	17.3	17.8	18.8	18.7	18.3	18.8	18.5	18.2	18.5	18.7	18.6	18.5	18.3	18.2	18.1	18.2	18.4	18.5	18.8	18.9
June	16.8	16.8	17.3	17.3	17.3	17.4	17.4	17.3	17.6	18.1	19.1	18.9	18.4	18.9	18.6	18.4	18.6	18.7	18.9	18.8	18.6	18.4	18.3	18.2	18.4	18.5	18.8	18.9
July	17.0	17.1	17.5	17.5	17.4	17.6	17.7	17.6	17.8	18.4	19.4	19.2	18.4	19.1	18.7	18.5	18.8	18.9	19.0	18.9	18.7	18.5	18.5	18.4	18.7	18.7	19.0	19.0
August	17.2	17.3	17.7	17.7	17.7	17.9	17.9	17.9	18.0	18.5	19.5	19.3	18.5	19.2	18.8	18.6	18.9	18.9	19.1	19.0	18.8	18.6	18.5	18.5	18.8	18.8	19.1	19.1
September	17.5	17.6	17.9	17.9	17.8	18.1	18.0	18.0	18.1	18.6	19.5	19.4	18.6	19.2	18.8	18.8	19.0	19.0	19.2	19.0	18.9	18.6	18.6	18.5	18.8	18.9	19.1	19.1
October	17.6	17.7	17.9	18.0	18.0	18.2	18.2	18.2	18.3	18.7	19.5	19.4	18.7	19.3	18.9	18.8	19.0	19.0	19.3	19.1	19.0	18.7	18.7	18.6	18.9	19.0	19.2	19.1
November	17.7	17.7	17.9	18.0	18.0	18.2	18.2	18.2	18.4	18.7	19.5	19.4	18.7	19.4	18.9	18.8	19.0	19.0	19.3	19.1	19.1	18.7	18.7	18.6	18.9	19.0	19.2	19.1
December	17.8	17.7	18.0	18.1	18.1	18.3	18.3	18.2	18.4	18.7	19.6	19.4	18.9	19.5	19.0	18.9	19.0	19.1	19.3	19.2	19.2	18.8	18.8	18.7	19.0	19.0	19.2	19.2
1929																												
January	17.8	17.8	18.0	18.2	18.0	18.3	18.3	18.2	18.3	18.6	19.5	19.5	18.8	19.5	19.0	18.9	19.1	19.1	19.2	19.2	19.1	18.8	18.7	18.7	19.0	19.0	19.2	19.2
February	17.8	17.8	18.1	18.2	18.2	18.3	18.3	18.3	18.4	18.7	19.6	19.5	18.9	19.5	19.1	18.9	19.1	19.1	19.3	19.3	19.1	18.8	18.7	18.7	19.1	19.0	19.2	19.2
March	17.8	17.9	18.1	18.2	18.3	18.2	18.4	18.3	18.4	18.7	19.6	19.5	18.9	19.5	19.1	18.9	19.2	19.1	19.3	19.2	19.1	18.8	18.7	18.7	19.2	19.0	19.2	19.2
April								18.4	18.5	18.8	19.7	19.6	19.0	19.6	19.1	19.0	19.3	19.2	19.4	19.3	19.2	18.9	18.8	18.8	19.2	19.1	19.3	19.2

London

Sanderson & Co., London, in circular of April 25, stress the fact that future competition in rubber production is between natives and Europeans, not between British and Dutch, saying:

Native production is by no means confined to the Netherland East Indies. M. S. Parry estimates that out of the Malayan planted acreage 500,000 acres are Asiatic and 750,000 acres are native holdings. He estimates native cultivation in the Netherland Indies at 1,500,000 acres, Malayan native production at 100,000 tons in 1927, and the Dutch native at 93,000 tons dry rubber. The principal object now is to have rubber at such a price as will reduce or eliminate competition of native rubber and it is impossible to tell where that price has to be.

The *Economist* of April 7, comments favorably on the Government's action for removal of restriction, stating:

We congratulate the Government on facing the hard facts of a very difficult situation and boldly taking the only proper course open to them. It is a step which they should have taken in 1926. It is obvious that a difficult and anxious position is created for many producers, but there is reason to believe the price of the commodity, after a period of readjustment will settle down at a price that will be remunerative to efficient producers. The situation is one that calls not for general dismay among rubber shareholders, but for discrimination in reviewing their holdings and their policy.

The *Financial News* of April 5 recalls that:

The Rubber Growers Association completed some years back, a scheme for controlled selling. It had been brought to a stage ready for landing, but was shelved for reasons connected with the working of restriction. We have reason to believe that this will be brought out for reconsideration. Its prospects of success would be enhanced with the assistance of the Dutch, and this prospect has been advanced by the recent conference, and by the coming abrogation of restriction.

Ormsby-Gore, Under Secretary of State for the Colonies, is quoted as stating:

The inception of the inquiry into restriction was due to the great advance in the use of reclaimed rubber and increased planting in countries outside the restriction area. He stressed the fact that restriction had not been abandoned owing to political expediency and urged development of high yielding trees by British producers.

The office of the American Legation, The Hague, Netherlands, summarizes interviews with prominent Netherland rubber producers, published in the *Amsterdam Telegraaf*:

The opinion is generally expressed that the abolition of restriction makes even more desirable an understanding between British and Dutch producers. Netherland producers point to the improving statistical position of rubber and believe that at present prices less native rubber will be produced while less reclaimed rubber will be used and think the future less somber than the prevailing market would indicate. The great decline in price is therefore attributed in large measure to psychological factors. The rejection by Congress of the Newton Bill legalizing import pools has passed almost unnoticed in this country.

The views of the Netherland Colonial Ministry with respect to the present crisis in rubber appear to be that it is not the desire of the Netherland Government to interfere with rubber matters because it would not only run counter to the wishes of Netherland producers but would involve setting up a complicated control. Moreover, the native producers would not understand any attempt by the government to curtail their activity. The belief has also been expressed that whatever happened to rubber prices there would be neither a great decline nor a great increase in the native production, this opinion being based on the fact that expansion is limited by labor difficulties.

Plantation Rubber Exports from Malaya*

January 1 to March 31, 1928

	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom.....	1,312.69	1,848.91	1,408.30
British Possessions.....	866.77	94.00	90.00
Continent of Europe.....	2,064.80	350.67	635.11
United States.....	40,470.35	7,107.49	1,968.09
Japan.....	3,382.00	569.50	475.00
Other countries.....	42.83	.....	.....
Totals.....	48,139.44	9,970.57	4,576.50

*Excluding all foreign transshipment.

New York Quotations

Following are the New York open market rubber quotations for one year ago, one month ago and May 25, the current date:

Plantation Hevea

	May 24, 1927	April 25, 1928	May 25, 1928
Rubber Latex (Hevea).....gal.	\$1.50 @	\$1.50 @	\$1.50 @
CREPE			
First latex, spot.....	.41½ @ .41½	.17½ @ .17½	.19½ @
June.....	.41½ @	.17½ @ .17½	.19½ @
July-September.....	.42½ @ .42½	.17½ @ .17½	.19½ @
October-December.....	.42½ @ .43	.18 @	.19½ @
January-March.....	.43½ @ .43½	.18 @	.20 @
Off latex, spot.....	.41½ @	.19 @	.19 @
Amber No. 2, spot.....	.39 @	.16 @ .16½	.18½ @
June.....	.39½ @	.16 @ .16½	.18½ @
July-September.....	.39½ @	.16½ @ .16½	.18½ @
October-December.....	.39½ @	.16½ @ .17	.18½ @
January-March.....	.40½ @	.19 @	.19 @
Amber No. 3, spot.....	.38½ @ .38½	.15½ @	.17½ @
Brown, thin, clean.....	.38½ @ .38½	.15½ @ .15½	.17½ @
Brown specky.....	.38 @	.15½ @	.17½ @
Brown, roll.....	.36½ @	.14½ @ .15	.17 @
Sole crepe.....	@	@	@

Sheet

Ribbed, smoked spot.....	.41 @	.17 @	.19 @
June.....	.41½ @	.17 @ .17½	.19½ @
July-September.....	.42 @ .42½	.17½ @ .17½	.19½ @
October-December.....	.42½ @	.17½ @ .17½	.19½ @
January-March.....	.43 @	.19 @	.19½ @

East Indian

PONTIANAK			
Banjermassin.....	.09 @	.08½ @ .09½	.09 @ .09½
Pressed block.....	.16 @	.14 @ .14½	.14½ @ .15
Sarawak.....	.09 @	.09½ @	.09½ @

South American

PARAS			
Upriver, fine.....	.37 @	.17½ @ .17½	.20 @
Upriver, fine.....	.45½ @	.26½ @	.26 @
Upriver, medium.....	.33 @	.15½ @	.18 @
Upriver, coarse.....	.26 @	.15 @	.14½ @
Upriver, coarse.....	.38 @	.23 @	.22 @
Islands, fine.....	.33 @	@	@
Islands, fine.....	.43 @	.26 @	.25 @
Acre, Bolivian, fine.....	.38 @	.18 @	.20 @
Acre, Bolivian, fine.....	.46 @	.27 @	.26 @
Beni, Bolivian.....	.38 @	.19 @	.19½ @
Madeira, fine.....	.37 @	.18 @	.19½ @
Peruvian, fine.....	.36 @	.17 @	.19 @
Tapajos, fine.....	.35 @	.17 @	.18 @

CAUCHO

Upper cauchó ball.....	.27 @	.15 @	.14 @
Upper cauchó ball.....	.39 @	.23 @	.22 @
Lower cauchó ball.....	.25 @	@	.13 @

Maniçobas

Ceará negro heads.....	.24 @	.17 @	.17 @
Ceará scrap.....	.12 @	.10 @	.10 @
Maniçoba, 30% guaranteed.....	.23 @	.19 @	.19 @
Mangabiera, thin sheet.....	.23 @	.19 @	.19 @

Centrals

Central scrap.....	.25 @	.15 @ .15½	.16 @
Central wet sheet.....	.17 @	.12 @	.12 @
Corinto scrap.....	.25 @	.15 @ .15½	.16 @
Esmeralda sausage.....	.25 @	@	.16 @

Guayule

Duro, washed and dried...	.33 @	.20 @	.20 @
Ampar.....	@	@	.21 @

Gutta Percha

Gutta Siak.....	.20½ @	.18 @ .18½	.18 @
Gutta Soh.....	.38 @	.29 @	.30 @ .32
Gutta Macassar.....	3.00 @	2.90 @ 3.00	2.80 @ 3.00

Balata

Block, Ciudad Bolivar....	.38 @	.39 @ .40	.38 @
Colombia.....	.36 @	.42 @ .43	.44 @
Manaos block.....	.42 @	.46 @	.44 @
Panama.....	.36 @	@	.44 @
Surinam, sheet.....	.62 @	.51 @ .52	.50 @ .51
Amber.....	.66 @	.54 @	.52 @

Chicle

Honduras.....	.65 @	.65 @	.64 @
Yucatan, fine.....	.65 @	.65 @	.64 @

*Washed and dried crepe. Shipment from Brazil.

†Nominal. ‡Duty paid.

Low and High New York Spot Prices

	1927*	May 1927	1926
PLANTATIONS			
First latex crepe.....	\$0.17½ @ \$0.19½	\$0.41 @ \$0.41½	\$0.42 @ \$0.50½
Smoked sheet, ribbed.....	.17½ @ .19½	.40½ @ .41½	.42 @ .50½
PARAS			
Upriver, fine.....	.18½ @ .20	.32½ @ .37	.34 @ .43
Upriver, coarse.....	.14½ @ .17	.23½ @ .26½	.20 @ .30½
Islands, fine.....	@	.28 @ .32	.33½ @ .39

*Figured to May 26, 1928.

Compounding Ingredients Market

TIRE production is proceeding at or near capacity in the Akron district which is considered the barometer of the trade in tires, tubes and accessories. The output of mechanical rubber goods is also on a liberal scale. In consequence the demand for general compounding ingredients continues quite active with much emphasis on lower prices.

ACCELERATORS. The recent final decision adverse to the Weiss patent claims on D. P. G. not only caused the price of that material to be drastically reduced but effected heavy reductions in the price of every other patented accelerator. The cut amounting on some of them to 40 per cent or more. A general weakness of material prices seems to have spread to many lines of compounding ingredients as a reaction from the violent break in accelerators. As affecting several of the very common and cheap materials the reduction will average 33 per cent.

ANTI-OXIDANTS. This class of materials has held its price level very well, perhaps, because they are not as yet held to be as essential as accelerators, certainly they are not consumed to the same extent as accelerators.

BENZOL. The demand is increasing and prices are firmer. A good export trade is in progress in benzol.

CARBON BLACK. There is a good movement on contracts and a

strong export trade. It is reported that price cutting is imminent here due to reductions in effect with the export trade.

CLAY. This is as always in heavy demand and the price has fallen considerably since last month.

DEGRAS. The use of this material as a softener is believed to be expanding steadily. Recent research results place it high in the list of softeners.

LITHARGE. A continuous improvement in demand for litharge is reported for the last month.

LITHOPONE. Production of this material is on a high basis. No price changes are expected for the second half of this year. The demand is very active.

MINERAL RUBBER. A dropping off in the demand for reclaim due to the low price of crude rubber has stimulated the substitution of MR and soft carbon mixed with some crude in the place of reclaim.

SOLVENT NAPHTHA. The rubber makers' demand has continued moderate.

STEARIC ACID. The rubber trade maintains a steady interest in stearic acid.

ZINC OXIDE. The irregular demand of early in the month has steadily improved until it now is good.

Accelerators, Inorganic

Lead, carbonate.....lb.	\$0.08 1/4 @
Lead, red.....lb.	.09 1/4 @
sublimed white.....lb.	.07 3/4 @
sublimed blue.....lb.	.07 3/4 @
super-sublimed white lead.....lb.	.08 1/4 @
Lime, R. M. hydrated.....lb.	12.50 @
Litharge.....lb.	.08 1/4 @
Magnesia, calcined.....lb.	.0375 @
calcined, heavy.....lb.	.04 @
carbonate.....lb.	.06 @
Orange mineral A.A.A.....lb.	.11 1/2 @

Accelerators, Organic

A-7.....lb.	.55 @	.65
A-11.....lb.	.62 @	.75
A-16.....lb.	.57 @	.65
A-19.....lb.	.58 @	.75
A-20.....lb.	.64 @	.80
Aldehyde ammonia.....lb.	.65 @	.70
B. B.....lb.	@	
Captax.....lb.	@	
Crylene, hard form.....lb.	@	
Paste.....lb.	@	
Di-ortho-tolylguanidine.....lb.	.48 @	.50 1/2
D. P. G.....lb.	.40 @	.41
Ethylidine aniline.....lb.	.45 @	.47 1/2
Formaldehyde aniline.....lb.	.31 @	.35 1/2
Grasselerator 102.....lb.	.62 1/2 @	.67 1/2
552.....lb.	4.45 @	
808.....lb.	1.00 @	1.10
833.....lb.	1.40 @	1.55
Heptene.....lb.	@	
Hexamethylene tetramine.....lb.	.57 1/2 @	.67 1/2
Lead oleate, No. 999.....lb.	.15 @	
Witco.....lb.	.13 @	
Methylene dianiline.....lb.	.36 @	.37
Monex.....lb.	@	
Piperidine pentamethylene dithio carbamate.....lb.	4.45 @	4.60
Plastone.....lb.	.35 @	.36
R. & H. 40.....lb.	@	
50.....lb.	@	
Safex.....lb.	@	
Super-sulphur, No. 1.....lb.	@	
No. 2.....lb.	@	
Tensilac No. 39.....lb.	@	
No. 41.....lb.	@	
Thermlo F.....lb.	3.25 @	
Thionex.....lb.	.24 @	.28
Thiocarbamilid.....lb.	@	
Trimene.....lb.	@	
base.....lb.	@	
Triphenylguanidine.....lb.	.65 @	.70
Tuads.....lb.	@	
Vulcanex.....lb.	.60 @	.62
Vulcanol.....lb.	.90 @	.92
Vulcone.....lb.	.60 @	.62
ZBX.....lb.	@	
Z-88.....lb.	.65 @	.75
Zimate.....lb.	@	

New York Quotations

May 25, 1928

Acids

Acetic 28% (bbls.).....100 lbs.	\$3.37 1/2 @	\$3.62 1/2
glacial (carboys).....100 lbs.	12.41 @	12.66
Sulphuric, 66%.....100 lbs.	1.35 @	1.60

Alkalies

Caustic soda, solid.....lb.	.03 @	
-----------------------------	-------	--

Anti-Oxidants

Age-Rite, powder.....lb.	@	
resin.....lb.	@	
Antox.....lb.	.72 @	.74
Neozone.....lb.	.65 @	.67
A.....lb.	.68 @	.90
Oxynone.....lb.	.54 @	.65
Resistox.....lb.	.65 @	
Stabilite.....lb.	@	
V. G. B.....lb.	@	

Colors

BLACK		
Bone.....lb.	.08 @	.09
Carbon (see Comp. Ing.)		
A. & W. nonfl No. 1.....lb.	.40 @	
Drop.....lb.	.06 @	.10
Lampblack (commercial).....lb.	.09 @	
BLUE		
A. & W. blue.....lb.	1.25 @	5.00
Du Pont, N.....100 lbs.	1.35 @	
Marine, A. C.....100 lbs.	1.30 @	
5 R.....100 lbs.	1.00 @	
2 G.....100 lbs.	.90 @	
Huber Brilliant.....lb.	4.20 @	
Prussian.....lb.	.31 @	.35
Ultramarine.....lb.	.06 @	.30

BROWN

Huber Mocha.....lb.	1.60 @	
Sienna, Italian, raw.....lb.	.05 1/2 @	.12 1/2

GREEN

A. & W. green.....lb.	1.25 @	3.00
Chrome, light.....lb.	.27 @	.31
medium.....lb.	.28 @	.31
dark.....lb.	.30 @	.33
Du Pont, A. C.....100 lbs.	3.00 @	
4 G.....100 lbs.	.60 @	
G. L.....100 lbs.	.30 @	
Y. L.....100 lbs.	.75 @	
Huber Brilliant.....lb.	3.85 @	
Oxide of chromium.....lb.	.32 @	.38

ORANGE

Du Pont, 2 R.....100 lbs.	1.40 @	
R. X.....100 lbs.	1.30 @	
Y. O.....100 lbs.	1.60 @	
Huber Persian.....lb.	.50 @	

Colors—(Continued)

RED		
A. & W. red.....lb.	\$0.75 @	\$3.50
purple.....lb.	2.00 @	4.00
Antimony, golden, No. 40.....lb.	@	
No. 60.....lb.	@	
golden 15/17%.....lb.	.16 @	.20
Aristi.....lb.	2.75 @	
Huber Brilliant.....lb.	1.35 @	
Antimony		
Crimson, R.M.P. No. 3.....lb.	.50 @	
Sulphur free.....lb.	.55 @	
7-A.....lb.	.35 @	
Z-2.....lb.	.22 @	
Vermilion, No. 5.....lb.	@	
No. 15.....lb.	@	
Du Pont, R. I.....100 lbs.	1.75 @	
6 B.....100 lbs.	.90 @	
Brilliant A. C.....100 lbs.	.90 @	
Iron Oxides		
bright pure domestic.....lb.	.12 @	
bright pure English.....lb.	.11 @	.14
bright reduced English.....lb.	.08 1/2 @	.10
bright reduced domestic.....lb.	.10 @	
Indian (maroon), pure domestic.....lb.	.11 @	
Indian (maroon), pure English.....lb.	.11 @	
Indian (maroon), reduced English.....lb.	.07 1/2 @	.09
Indian (maroon), reduced domestic.....lb.	.08 @	
Oximony.....lb.	.13 1/4 @	
Spanish red oxide.....lb.	.03 @	.04 1/4
Sunburnt red.....lb.	.14 @	
Venetian reds.....lb.	.02 @	.06
Vermilion, Eng. quicksilver.....lb.	1.85 @	
WHITE		
Lithopone.....lb.	.05 1/4 @	.05 1/4
Albalith.....lb.	@	
Azolith.....lb.	.05 1/4 @	.06
Grasselli.....lb.	.05 1/4 @	.05 1/4
Sterling.....lb.	@	
Vanolith.....lb.	.05 1/4 @	
Titanox.....lb.	.10 @	.10 1/4
Zinc Oxide		
AAA (lead free).....lb.	.07 @	
Azo (factory):		
ZZZ (lead free).....lb.	.06 1/4 @	.07
ZZ (lead).....lb.	.06 1/4 @	.06 1/4
Z (8% lead).....lb.	.06 1/4 @	.06 1/4
French Process		
Green seal.....lb.	.10 1/4 @	
Red seal.....lb.	.09 1/4 @	
White seal.....lb.	.11 1/4 @	
Kadox.....lb.	@	
XX.....lb.	@	
YELLOW		
A. & W. yellow.....lb.	2.00 @	4.00
Cadmium sulphide.....lb.	1.35 @	2.00
Chrome.....lb.	.16 @	.17
Du Pont N.....100 lbs.	4.00 @	
R. W.....100 lbs.	.78 @	
Grasselli cadmium.....lb.	@	
Huber Canary.....lb.	3.30 @	
Ochre, domestic.....lb.	.01 1/4 @	.02 1/4
Oxide, pure.....lb.	.08 1/4 @	
Zinc imported.....lb.	.25 @	

Compounding Ingredients

Aluminum flake (sacks c.l.).....ton	\$21.85	@
(sacks l.c.l.).....ton	24.30	@
Ammonium carbonate powd.....lb.	.11	@
lump.....lb.	.10	@
Asbestine.....ton	13.40	@ 14.50
Barium, carbonate.....ton	60.00	@
Barytes, imported.....ton	27.50	@
dry ground, white.....ton	34.50	@
dry ground, off color.....ton	22.50	@
No. 1 Missouri, water ground and floated, St. Louis.....ton	23.00	@
Basofo.....lb.	.04 1/2	@
Blanc fixe, dry.....lb.	.04 1/2	@
pulp.....ton	50.00	@
Carbon Black		
Aeroflot attow.....lb.	.08	@ .12
Compressed.....lb.	.07 1/2	@ .11 1/2
Uncompressed.....lb.	.07	@ .11
Micronex.....lb.	.08	@ .12
Carrara filler.....ton	20.00	@
Chalk, precipitated.....lb.	.04 1/2	@ .04 1/2
Clay, Blue Ridge, dark.....ton		@
Blue Ridge, light.....ton		@
China.....lb.	.01 1/2	@
Dixie.....ton		@
Langford.....ton		@
Mineral flour (Florida).....ton		@
Perfection.....ton	13.50	@
Suprex.....ton		@
Tensulite.....ton	12.00	@
Cotton rock, black.....lb.	.13	@ .11
light-colored.....lb.	.10	@ .11
white.....lb.	.11	@ .10
Glow, high grade.....lb.	.24	@ .28
low grade.....lb.	.21	@ .25
Infusorial earth.....ton	25.00	@
Mica, amber (fact'y).....ton	80.00	@
Pumice stone, powd.....lb.	.02 1/2	@ .04
Rotten stone (bbls.).....lb.	.02 1/2	@ .04 1/2
Soap bark.....lb.	.15 1/2	@ .16
Soapstone.....ton	15.00	@ 22.00
Talc, domestic.....ton	18.00	@ 25.00
French.....ton	18.00	@ 22.00
Pyrex A.....ton		@
B.....ton		@
Thermatomic carbon.....lb.		@
Velvetex.....lb.	.04	@ .07
Whiting:		
Commercial.....100 lbs.	.85	@ 1.00
English, cliffstone.....100 lbs.	1.50	@
Quaker.....ton		@
Snow white.....ton		@
Sussex.....ton		@
Vancollid.....ton	27.00	@
Vansulite.....ton	12.00	@
Westminster Brand.....100 lbs.		@
Witco (c.l.) (fact'y).....ton	12.00	@
Whiting, imp. chalk.....100 lbs.	9.00	@ 1.10
Paris White, Eng. Cliff.....100 lbs.	1.65	@ 3.00

New York Quotations

May 25, 1928

Factice—See Rubber Substitutes

Mineral Rubber

Fluxrite (solid).....lb.	\$0.05	@ \$0.06
Genasco (fact'y).....ton	30.00	@ 52.00
Gilsonite (fact'y).....ton	37.14	@ 39.65
Granulated M. R.....ton		@
Hydrocarbon, hard.....ton		@
Hydrocarbon, soft.....ton		@
Ohmlac Kanak, M. R.....ton	40.00	@ 90.00
M-4.....ton	12 1/2	@
Paradura (fact'y).....ton	62.50	@ 65.00
Pioneer, M. R., solid (fac.).....ton	42.00	@ 44.00
M. R. granulated.....ton	52.00	@ 54.00
Robertson, M. R., solid (fact'y).....ton	34.00	@ 80.00
M. R. gran. (fact'y).....ton	38.00	@ 80.00
Vansul Pure.....ton	26.00	@

Oils

Mineral.....gal.	.20	@
Kerosene.....gal.	.15	@
Ramsell.....gal.	.87	@
Red oil, distilled.....lb.	.00 1/2	@ .10 1/2
Rubber process.....gal.	.75	@
Spindle.....gal.	.28	@

Rubber Substitutes or Factice

Black.....lb.	.08	@ .14
Brown.....lb.	.08 1/2	@ .15
White.....lb.	.08 1/2	@ .16

Softeners

Burgundy pitch.....100 lbs.	5.50	@
Atlas.....100 lbs.	5.75	@
Corn oil.....lb.	.11 1/2	@
Cotton oil.....lb.	.11	@
Cyclone oil.....gal.	.27	@ .33
Dezras.....lb.	.03 1/2	@ .04 1/2
Fluxrite (fluid).....lb.	.05	@ .06
Hexalin.....lb.	.60	@
Malrite.....lb.	.70	@
Moldrite.....lb.	.07 1/2	@ .08 1/2
Palm oil (Lagos).....lb.	.10 1/2	@
Palm oil (Niger).....lb.	.10	@
Palm oil (Witco).....lb.	.08 1/2	@
Para-flux.....gal.	.17	@
Petrolatum, snow white.....lb.	.08 1/2	@ .09
Pigmentar.....gal.	.33	@ .38
Pine oil, steam distilled.....gal.	.68	@
Rosin K.....bbl.	9.50	@
Rosin oil, compounded.....gal.	.30	@
No. 1.....gal.	.54	@
No. 556.....gal.	.43	@
White.....lb.	.10	@
Ruback.....lb.	.08 1/2	@
Shellac, orange.....lb.	.70	@

Softeners—(Continued)

Stearax.....lb.	\$0.10	@ \$0.14
Stearic acid, double press'd.....lb.	.11 1/2	@ .12 1/2
Tackol.....lb.	.09	@ .15
Tar (retort).....bbl.	14.00	@
Tasco W-S No. 1.....lb.	.06	@
A.....lb.	.05	@
Vansulol.....lb.	.10 1/2	@
Vantar (Pine Tar).....gal.	.36	@ .40
Waxene.....lb.	.30	@
Woburn oil.....lb.	.05 1/2	@ .06

Solvents

Benzol (90%, 7.21 lbs. gal.) gal.	.27	@ .28
Carbon bisulphide (99.9%, 10.81 lbs. gal.) (drums) lb.	.05	@ .06
tetrachloride (99.7%, 13.28 lbs. gal.) (drums).....lb.	.07	@ .07 1/2

Gasoline

No. 303		
Tankcars.....gal.	.16	@
Drums, c. l.....gal.	.27	@
Drums, l. c. l.....gal.	.29	@
Dip-Sol.....gal.	.11 1/2	@
Rubberlene.....gal.	.10 1/2	@
Rub Sol.....gal.	.09 1/2	@
Solvent naphtha.....gal.	.35	@
Sweet rubber cement		
naphtha.....gal.	.15	@
Turpentine, Venice.....lb.	.20	@
steam distilled.....gal.	.53	@ .54

Vulcanizing Ingredients

Sulphur

Velvet flour (240 lb. bbls.) 100 lbs.	2.95	@ 3.50
(150 lb. bags).....100 lbs.	2.60	@ 3.15
Soft rubber (c.l.).....100 lbs.	2.40	@ 2.75
(l.c.l.).....100 lbs.		@
Superfine commercial flour (210 lb. bbls.).....100 lbs.	2.55	@ 3.10
(100 lb. bags).....100 lbs.	2.20	@ 2.80
Tire brand, superfine.....100 lbs.	1.90	@ 2.25
Tube brand, velvet.....100 lbs.	2.40	@ 2.75
Vandex.....lb.		@
(See also Colors—Antimony)		

Waxes

Beeswax, white, com.....lb.	.55	@
carnauba.....lb.	.33	@ .60
ceresine, white.....lb.	.12	@
montan.....lb.	.07 1/2	@
ozokerite, black.....lb.	.27	@
green.....lb.	.28	@

Paraffin

122/124 white crude scale.....lb.	.03	@
124/126 white crude scale.....lb.	.03 1/2	@
120/122 fully refined.....lb.	.05 1/2	@
125/127 fully refined.....lb.	.06	@

Solids Quicker in Braking

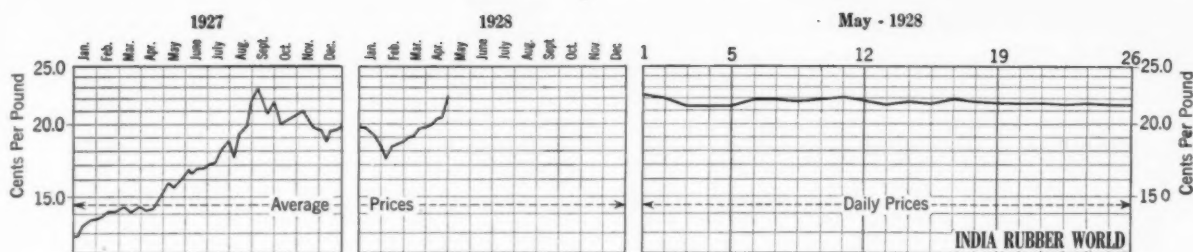
*Tests Show Buses With Such Tires Are Stopped Sooner Than With Pneumatics
Sandstone Paving Most Anti-Skid*

Buses equipped with solid tires can be stopped in a shorter distance than those having pneumatics, and sandstone pavement offers more resistance to skidding than asphalt or woodblock, especially if a road surface be wet or greasy—according to tests recently made by M. Abadie for the Public Transport Company, of Paris, and covering many car, tire, and road conditions. The test cars were the ordinary 4-wheel, 28-passenger buses, weighing 11,440 pounds when empty and 17,160 pounds loaded. One bus had all new 41 by 7.4 pneumatic tires, single in front and dual in rear; another had the same equipment, but all tires were well worn; a third bus had all new 38 by 6.4 solid tires with unsymmetrical section, single in front and dual in rear; and the fourth had the same tires but much worn.

At a given signal the drivers, running at a uniform speed of 12 1/2 miles an hour, applied the hand brake on crossing a base line, and, to allow for grade differences, each vehicle was run four times in one direction and four times in a reverse direction. In each case the speed within 100 feet of the base line was carefully chronometered. It was found that

on dry pavements the average stopping distances with solid tires were: Asphalt 16.6 feet, sandstone 16.6 feet, woodblock 17.2 feet; and for pneumatic tires 17.7, 17.5, and 20.3 feet, respectively. The differences were more marked, however, on a swept, watered pavement. Solid tired buses were stopped within 38.9 feet on asphalt, 19.9 feet on sandstone, and 44 feet on woodblock; while the best stopping made with pneumatic tires on similar paving material was 57, 22.5, and 46 feet, respectively. Averaged on pavements in all conditions, pneumatics showed 16 per cent more stopping distance than solid tires.

New and worn solid tires did not show much difference in braking efficiency, the new ones requiring an average of 31.1 feet and the old 30.8 feet. With pneumatics, however, there was a marked difference. While new tires with good anti-skid treads held down to a 36 foot average, the worn ones traveled 48.8 feet before the buses could be brought to a full stop, the worst results being on wet, greasy roads. On an average the stopping distances with well-worn pneumatics were 30 per cent greater than with new casings.



Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton

Market for Cotton and Fabrics

AMERICAN COTTON. The price for middling spot cotton on May 1 was 22.30 cents compared with 19.00 cents on April 1. On May 14 it was 21.55 cents, and 21.10 cents on the 26th. During the first week of May the market encountered some violent price changes. The main feature at that time was the unfavorable weather conditions prevailing over the cotton belt generally causing much speculative buying on the poor outlook for the 1928 yield. The crop start is late and its progress depends much on the sort of weather to come.

Violent price fluctuations continued to characterize the course of the market up to the middle of the past month. Rains and low temperatures prevailed over practically the entire belt and caused a discouraging outlook. Should such unfavorable conditions be long continued higher prices must result for it is generally acknowledged that great 1928 yield is necessary to meet the world's requirements.

EGYPTIAN COTTON. The report of the Staple Association of May 11 follows: "New crop prospects are very backward in the Delta. Stands are poor. Where the cotton is up, it is small and sickly in appearance. Rains as well as warm weather are needed. Complaints of cotton dying are coming in daily. Unless an improvement occurs very shortly, serious and lasting damage to the Delta crop is almost inevitable."

Cotton Fabrics

DUCKS, DRILLS AND OSNABURGS. General business in these fabrics for mechanical goods has improved the past month not only

on account of the advance of raw cotton prices but also by reason of the small stocks on hand. A continuation of improved demand for goods is confidently expected.

RAINCOAT FABRICS. Practically no change has occurred in the raincoat business. The only bright spot today is the trench coat which is selling in a small way but not in large volume. It is believed that this type of coat will be one of this season's outstanding sellers.

SHEETINGS. For the past two weeks the market was quiet, nevertheless there has been scattered buying by individual companies for prompt and nearby deliveries. In many instances these purchases ran into large quantities but the general market has not been inclined to purchase at the prevailing prices which are very firm.

TIRE FABRICS. New orders have become few and far between for the last few weeks. This is doubtless a reflection of conditions in the tire trade where the drop in crude rubber prices has slowed up the placing of new orders. However, fabric mills have a fair volume of business booked and are probably quite fully sold up for the next 60 or 90 days. The advance in the price of cotton has stiffened the price of tire fabrics to some extent but business has not been active enough to actually try out these prices and demonstrate that the market has advanced.

The tire trade has made comparatively small purchases of staples to date but should enter the market shortly for the balance of its seasonal requirements. Egyptian Uppers remain quoted at the high levels of 31 to 32 cents, and it appears certain that the tire mills will turn to Delta staples in volume if the present discount of 5 to 6 cents per pound between these qualities continues.

Drills

38-inch 2.00-yard.....yard	\$0.18½ @
40-inch 1.47-yard.....yard	.10¾ @
50-inch 1.52-yard.....yard	.25 @
52-inch 1.90-yard.....yard	.14½ @
52-inch 2.20-yard.....yard	.17½ @
59-inch 1.85-yard.....yard	.20½ @

Ducks

38-inch 2.00-yard S. F. yard	.19 @
40-inch 1.45-yard S. F. ....	.26½ @
72-inch 1.05-yard D. F. ....	.38 @
72-inch 1.66-ounce.....	.41½ @
72-inch 17.21-ounce.....	.43 @

MECHANICAL

Hose and belting.....pound	.36 @
Specials.....	.40 @

TENNIS

52-inch 1.35-yard.....yard	.28½ @
----------------------------	--------

Hollands

RUBBER TRADE SPECIAL

R. T. 3 A.	
31-inch.....yard	.20 @
40-inch.....	.25 @
50-inch.....	.45 @

RED SEAL

36-inch.....	.15½ @
40-inch.....	.16½ @
50-inch.....	.25 @

GOLD SEAL

40-inch, No. 72.....	.20¾ @
40-inch, No. 80.....	.22 @

New York Quotations

May 25, 1928

Osnaburgs

40-inch 2.35-yard.....yard	.15¾ @
40-inch 2.48-yard.....	.14¾ @
40-inch 3.00-yard.....	.12¾ @
37-inch 2.42-yard.....	.15¾ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60.....yard	.11¾ @
Bombazine 60 x 48.....	.10¾ @
Plaids 60 x 48.....	.12¾ @
Plaids 48 x 48.....	.11¾ @
Surface prints 64 x 60.....	.13¾ @
Surface prints 60 x 48.....	.12¾ @
Print cloth 38½-in., 60 x 64.	.07¾ @

Sheetings, 40-inch

48 x 48, 2.50 yard.....yard	.12¾ @	.12¾ @
48 x 48, 2.85-yard.....	.11¾ @	.11¾ @
64 x 68, 3.15 yard.....	.12¾ @	
56 x 60, 3.60-yard.....	.10 @	.10¾ @
44 x 48, 3.75-yard.....	.09¾ @	.09¾ @

Sheetings, 36-inch

48 x 48, 5.00 yard.....yard	.07¾ @	.07¾ @
40 x 44, 6.15-yard.....	.06¾ @	.06¾ @

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Egyptian, karded.....pound	@
Peeler, karded.....	\$0.47 @

BUILDER 23/11

Peeler, karded.....pound	.47 @
--------------------------	-------

BUILDER 10/5

Peeler, karded.....pound	.39 @
--------------------------	-------

CORD 23/5/3

Egyptian, combed.....pound	@
Egyptian, karded.....	@
Peeler, karded, 1½-in.....	.47 @

CORD 23/4/3

Peeler, karded.....pound	.48 @
--------------------------	-------

CORD 23/3/3

Peeler, karded.....pound	.54 @
--------------------------	-------

CORD 13/3/3

Peeler, karded.....pound	.45 @
--------------------------	-------

CORD 13/3/3

Peeler, karded.....pound	.44 @
--------------------------	-------

LENO BREAKER

8-oz. Peeler, karded.....pound	.49 @
10-oz. Peeler, karded.....	.49 @

CHAFER

9.5-oz. Peeler, karded.....pound	@
12-oz. Peeler, karded.....	@
14-oz. Peeler, karded.....	.39 @

United States Rubber Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	February, 1928		Two Months Ended February, 1928	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—Free				
Crude rubber	75,406,315	\$27,763,655	163,007,408	\$58,042,099
Balata	72,887	32,165	133,643	56,383
Jelutong or Pontianak	903,250	142,621	2,219,465	326,326
Gutta percha	699,291	215,085	1,035,277	301,787
Guayule	1,096,200	281,295	2,064,700	523,634
Rubber scrap	1,829,173	65,808	4,602,277	158,973
Totals	80,007,116	\$28,500,629	173,062,770	\$59,409,202
Chicle	dutyable 2,694,572	\$1,377,338	3,669,277	\$1,889,112
MANUFACTURED—Dutyable				
Rubber belting	44,357	\$24,935	79,620	\$41,040
Rubber tires	468	17,330	772	24,447
Other manufactures of rubber	.....	123,744	.....	248,685
Totals	44,825	\$166,009	80,392	\$314,172

EXPORTS OF FOREIGN MERCHANDISE

RUBBER MANUFACTURES				
Crude rubber	6,134,197	\$2,229,589	10,588,201	\$3,964,579
Balata	10,329	4,600	52,896	23,416
Gutta percha and rubber substitutes and scrap	81,342	9,895	92,542	10,567
Rubber manufactures	.....	7,255	.....	31,365
Totals	6,225,868	\$2,251,339	10,733,639	\$4,029,927

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
India Rubber				
Reclaimed	1,820,729	\$143,774	3,806,946	\$291,994
Scrap and old	4,079,255	248,387	8,200,691	502,646
Footwear				
Boots	74,130	190,852	145,852	344,046
Shoes	123,167	114,876	294,562	253,211
Canvas shoes with rubber soles	380,466	287,602	812,239	614,925
Rubber water bottles and fountain syringes	25,567	18,058	57,783	35,603
Rubber gloves	7,619	22,473	14,584	45,650
Other druggists' rubber sundries	.....	42,999	.....	67,118
Bathing caps	19,971	41,474	25,328	56,006
Hard rubber goods				
Electrical hard rubber goods	189,107	34,610	288,333	63,813
Other hard rubber goods	.....	33,508	.....	64,289
Tires				
Casings, automobile	182,073	2,330,060	369,549	4,739,088
Tubes, automobile	123,011	243,649	254,882	532,928
Other casings and tubes	3,004	6,402	5,672	12,626
Solid tires for automobiles and motor trucks	4,301	157,783	8,954	323,393
Others	220,227	48,005	401,438	89,525
Tire accessories	.....	132,797	.....	239,306
Rubber and friction tape	72,881	25,264	164,209	53,503
Belting	462,785	253,844	991,514	520,007
Hose	573,468	208,827	1,211,992	442,900
Packing	284,007	126,160	489,697	222,893
Soles and heels	100,602	163,193	201,861	286,577
Thread	118,410	134,004	252,145	287,216
Rubber bands and erasers	67,760	49,514	133,105	93,061
Other rubber manufactures	.....	162,404	.....	338,190
Totals	.....	\$5,220,519	.....	\$10,520,514
Rubber toys and balls	.....	58,721	.....	\$14,444
Rubber balloons	46,211	\$51,390	84,345	\$94,781

Crude Rubber Imports by Customs Districts

	*March, 1928		Three Months Ended *March, 1928	
	Pounds	Value	Pounds	Value
Massachusetts	4,002,120	\$1,329,291	13,150,284	\$4,237,538
New York	76,485,502	26,845,770	220,746,408	78,675,315
Philadelphia	2,261,864	862,536	3,658,422	1,255,318
Maryland	3,478,817	1,317,966	5,773,354	2,093,004
Los Angeles	4,484,367	1,596,439	8,422,272	3,047,810
San Francisco	107,607	35,288	220,515	72,627
Oregon	.....	.....	33,700	11,803
Ohio	321,806	122,086	1,864,536	647,311
Wisconsin	.....	.....	280,000	110,749
Totals	91,142,083	\$32,109,376	254,149,491	\$90,151,475

*Including latex, dry rubber content.

London Stocks, March 1928

	Landed for Mar. Tons	Delivered for Mar. Tons	Stocked March 31		
			1928 Tons	1927 Tons	1926 Tons
LONDON					
Plantation	9,327	14,046	58,108	62,851	12,971
Other grades	30	.....	119	132	110
LIVERPOOL					
Plantation	1441	1651	12,133	12,579	1986
Total tons, London and Liverpool	9,798	14,697	60,360	65,562	14,069

*Official returns from the six recognized public warehouses.

United Kingdom Rubber Statistics

IMPORTS

	March, 1928		Three Months Ended March, 1928	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber				
From—				
Straits Settlements	10,074,700	£554,314	26,077,500	£1,707,800
Federated Malay States	.....	308,156	12,180,600	789,697
British India	1,813,100	98,762	4,875,800	337,326
Ceylon and Dependencies	2,838,400	156,807	8,534,200	591,897
Other Dutch possessions in Indian Seas	1,983,600	113,962	7,110,800	500,990
Dutch East Indies (except other Dutch possessions in Indian Seas)	3,236,800	171,490	8,637,000	585,139
Other countries in East Indies and Pacific not elsewhere specified	201,100	10,282	974,500	67,611
Brazil	281,700	15,708	1,479,300	90,058
South and Central America (except Brazil)	58,100	3,020	91,600	5,376
West Africa	.....	.....	.....	.....
French West Africa	.....	.....	8,100	423
Gold Coast	78,300	4,092	168,600	10,880
Other parts of West Africa	68,200	3,317	415,400	25,914
East Africa, including Madagascar	62,500	3,027	365,500	25,315
Other countries	165,400	9,297	321,400	20,248
Totals	26,635,700	£1,452,234	71,240,300	£4,758,674
Waste and reclaimed rubber	915,100	12,640	2,855,300	39,632
Gutta percha and balata	473,700	37,678	1,041,300	92,423
Rubber substitutes	1,100	35	4,400	105
Totals	28,025,600	£1,502,587	75,141,300	£4,890,834

MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers	.....	£78,845	.....	£190,810
Inner tubes	.....	18,077	.....	37,966
Solid tires	.....	3,808	.....	15,609
Boots and shoes	99,648	162,764	201,830	347,993
Other rubber manufactures	.....	221,883	.....	497,115
Totals	.....	£485,377	.....	£1,089,493

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	3,118,700	£26,223	8,722,200	£76,130
Rubber substitutes	25,500	582	145,600	3,799
Totals	3,144,200	£26,805	8,867,800	£79,929
MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers	.....	£216,254	.....	£552,693
Inner tubes	.....	40,254	.....	106,344
Solid tires	.....	22,829	.....	64,587
Boots and shoes	19,922	34,160	49,435	80,008
Other rubber manufactures	.....	289,856	.....	731,222
Totals	.....	£603,353	.....	£1,534,854

EXPORTS—COLONIAL AND FOREIGN

	March, 1928		Three Months Ended March, 1928	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber				
To—				
Russia	321,100	£28,797	1,909,900	£164,700
Sweden, Norway and Denmark	271,500	20,205	602,600	47,867
Germany	3,795,600	259,105	10,614,000	810,612
Belgium	832,200	58,451	2,148,500	162,751
France	2,165,800	155,305	7,046,800	558,189
Spain	256,300	20,952	616,700	52,531
Italy	1,657,600	119,132	3,763,700	291,987
Other European countries	326,200	30,608	1,098,800	103,005
United States	9,738,700	687,481	24,594,100	1,857,720
Canada	.....	4,600	.....	571
Other countries	150,400	10,996	376,600	30,821
Totals	19,515,400	£1,391,032	52,776,300	£4,080,754
Waste and reclaimed rubber	15,500	323	80,200	1,436
Gutta percha and balata	152,600	9,186	274,300	23,946
Rubber substitutes	1,100	35	1,100	35
Totals	19,684,600	£1,400,576	53,131,900	£4,106,171
MANUFACTURED				
*†Tires and tubes				
Pneumatic				
Outer covers	.....	£14,381	.....	£31,333
Inner tubes	.....	4,723	.....	6,769
Solid tires	.....	222	.....	1,183
Boots and shoes	1,169	2,762	2,230	5,236
Other rubber manufactures	.....	11,896	.....	31,541
Totals	.....	£33,984	.....	£76,062

* After April 12, 1927, tires and tubes imported or exported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

† Motor cars, motorcycles, parts and accessories, liable to duty from September 29, 1915, until August 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

‡ Tires and tubes included prior to April 12, 1927.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

	CASES
APRIL 14. By "Medon," Far East.	
H. A. Astlett & Co.	329
General Rubber Co.	5,736
APRIL 14. By "View Amsterdam," Europe.	
H. A. Astlett & Co.	108
General Rubber Co.	277
APRIL 16. By "Norwegian," Europe.	
Littlejohn & Co., Inc.	277
APRIL 16. By "Scythia," London.	
Baird Rubber & Trading Co., Inc.	131
APRIL 16. By "Silver Maple," Far East.	
H. A. Astlett & Co.	2,658
Baird Rubber & Trading Co., Inc.	700
General Rubber Co.	4,595
Haldane & Co., Inc.	220
Littlejohn & Co., Inc.	2,405
The Meyer & Brown Corp.	2,925
The Meyer & Brown Corp.	*100
H. Muehlstein & Co., Inc.	150
Poel & Kelly, Inc.	85
Rogers Brown & Crocker Bros., Inc.	805
Charles T. Wilson Co., Inc.	357
APRIL 16. By "Tuscania," London.	
Baird Rubber & Trading Co., Inc.	495
Bierrie & Co., Inc.	100
General Rubber Co.	275
The Meyer & Brown Corp.	257
H. Muehlstein & Co., Inc.	141
APRIL 17. By "London Exchange," London.	
Baird Rubber & Trading Co., Inc.	148
The Meyer & Brown Corp.	330
APRIL 17. By "Pres. Hayes," Far East.	
H. A. Astlett & Co.	1,345
Baird Rubber & Trading Co., Inc.	350
Bierrie & Co., Inc.	50
General Rubber Co.	3,644
Haldane & Co., Inc.	500
Littlejohn & Co., Inc.	3,406
The Meyer & Brown Corp.	2,267
The Meyer & Brown Corp.	*329
H. Muehlstein & Co., Inc.	560
Poel & Kelly, Inc.	1,040
Poel & Kelly, Inc.	*250
Raw Products Co.	100
Rogers Brown & Crocker Bros., Inc.	357
Charles T. Wilson Co., Inc.	171
APRIL 18. By "Minnewaska," London.	
Baird Rubber & Trading Co., Inc.	3,971
Bierrie & Co., Inc.	463
General Rubber Co.	671
The Meyer & Brown Corp.	396
APRIL 19. By "Mahseer," Far East.	
General Rubber Co.	2,150
Haldane & Co., Inc.	100
Poel & Kelly, Inc.	269
APRIL 19. By "Pres. Lincoln," Far East.	
H. A. Astlett & Co.	*1250
Poel & Kelly, Inc.	1400
APRIL 21. By "Innoko," Europe.	
Littlejohn & Co., Inc.	100
APRIL 22. By "Myrtlebank," Far East.	
H. A. Astlett & Co.	1,178
General Rubber Co.	1,039
Littlejohn & Co., Inc.	2,469
The Meyer & Brown Corp.	916
The Meyer & Brown Corp.	*350
H. Muehlstein & Co., Inc.	350
Raw Products Co.	120
APRIL 23. By "American Banker," London.	
Baird Rubber & Trading Co., Inc.	120
APRIL 23. By "Minnesota," London.	
Baird Rubber & Trading Co., Inc.	762
Charles T. Wilson Co., Inc.	287
APRIL 24. By "Nelus," Far East.	
H. A. Astlett & Co.	1,440
Baird Rubber & Trading Co., Inc.	500
Bierrie & Co., Inc.	300
General Rubber Co.	1,576
Hood Rubber Co.	*70
Littlejohn & Co., Inc.	2,190
The Meyer & Brown Corp.	1,215
H. Muehlstein & Co., Inc.	*300
Poel & Kelly, Inc.	350
Poel & Kelly, Inc.	150
Raw Products Co.	250
Rogers Brown & Crocker Bros., Inc.	
APRIL 26. By "City of Kimberley," Far East.	
H. A. Astlett & Co.	2,300
Baird Rubber & Trading Co., Inc.	680
General Rubber Co.	1,689
Haldane & Co., Inc.	275
Hood Rubber Co.	152
Littlejohn & Co., Inc.	1,573
The Meyer & Brown Corp.	3,566
The Meyer & Brown Corp.	*50

*Arrived at Boston.

*Arrived at Los Angeles.

	CASES
H. Muehlstein & Co., Inc.	250
Raw Products Co.	50
Rogers Brown & Crocker Bros., Inc.	1,117
APRIL 27. By "Chinese Prince," Far East.	
H. A. Astlett & Co.	1,004
Baird Rubber & Trading Co., Inc.	650
Bierrie & Co., Inc.	250
General Rubber Co.	6,224
Haldane & Co., Inc.	600
Hood Rubber Co.	*140
Littlejohn & Co., Inc.	5,519
The Meyer & Brown Corp.	3,329
The Meyer & Brown Corp.	*250
H. Muehlstein & Co., Inc.	1,260
Raw Products Co.	300
Rogers Brown & Crocker Bros., Inc.	1,040
Charles T. Wilson Co., Inc.	725
APRIL 27. By "Silverlarch," Far East.	
General Rubber Co.	*1411
The Meyer & Brown Corp.	168
APRIL 29. By "Sawukia," Far East.	
Bierrie & Co., Inc.	50
General Rubber Co.	1,720
Haldane & Co., Inc.	100
Littlejohn & Co., Inc.	422
Poel & Kelly, Inc.	50
Raw Products Co.	112
Rogers Brown & Crocker Bros., Inc.	112
APRIL 30. By "Bowes Castle," Far East.	
H. A. Astlett & Co.	1,540
General Rubber Co.	5,366
Haldane & Co., Inc.	75
Hood Rubber Co.	304
Littlejohn & Co., Inc.	4,747
The Meyer & Brown Corp.	2,012
H. Muehlstein & Co., Inc.	250
Poel & Kelly, Inc.	175
Raw Products Co.	50
Rogers Brown & Crocker Bros., Inc.	*120
Rogers Brown & Crocker Bros., Inc.	730
Charles T. Wilson Co., Inc.	150
APRIL 30. By "City of Salisbury," Far East.	
General Rubber Co.	1,745
Littlejohn & Co., Inc.	854
H. Muehlstein & Co., Inc.	860
Raw Products Co.	56
Charles T. Wilson Co., Inc.	146
APRIL 30. By "Laconia," London.	
Bierrie & Co., Inc.	172
The Meyer & Brown Corp.	68
MAY 1. By "Lancastria," Europe.	
H. A. Astlett & Co.	170
Baird Rubber & Trading Co., Inc.	128
Bierrie & Co., Inc.	395
General Rubber Co.	1,186
Poel & Kelly, Inc.	2,111
Rogers Brown & Crocker Bros., Inc.	160
MAY 1. By "Minnetonka," London.	
Baird Rubber & Trading Co., Inc.	2,356
Bierrie & Co., Inc.	1,224
General Rubber Co.	14,150
Haldane & Co., Inc.	264
The Meyer & Brown Corp.	968
Poel & Kelly, Inc.	1,619
Rogers Brown & Crocker Bros., Inc.	367
Charles T. Wilson Co., Inc.	954
MAY 1. By "Pres. Polk," Far East.	
H. A. Astlett & Co.	1,630
Baird Rubber & Trading Co., Inc.	1,750
Bierrie & Co., Inc.	150
General Rubber Co.	1,270
Littlejohn & Co., Inc.	598
The Meyer & Brown Corp.	1,639
H. Muehlstein & Co., Inc.	890
Poel & Kelly, Inc.	100
Rogers Brown & Crocker Bros., Inc.	662
Charles T. Wilson Co., Inc.	250
MAY 3. By "Bolivian," Europe.	
Littlejohn & Co., Inc.	20
MAY 3. By "Matheran," Far East.	
General Rubber Co.	1,190
The Meyer & Brown Corp.	560
MAY 4. By "Menado," Far East.	
H. A. Astlett & Co.	822
Baird Rubber & Trading Co., Inc.	76
Bierrie & Co., Inc.	356
General Rubber Co.	3,331
Hood Rubber Co.	*320
Littlejohn & Co., Inc.	2,263
The Meyer & Brown Corp.	1,057
Poel & Kelly, Inc.	*15
Raw Products Co.	68
Rogers Brown & Crocker Bros., Inc.	432
MAY 5. By "City of Evansville," Far East.	
General Rubber Co.	920
Hood Rubber Co.	*42
Littlejohn & Co., Inc.	1,899
The Meyer & Brown Corp.	105
Charles T. Wilson Co., Inc.	141

	CASES
MAY 5. By "Theseus," Far East.	
H. A. Astlett & Co.	668
Baird Rubber & Trading Co., Inc.	1,490
General Rubber Co.	5,301
Haldane & Co., Inc.	311
Littlejohn & Co., Inc.	1,255
The Meyer & Brown Corp.	3,349
The Meyer & Brown Corp.	*210
H. Muehlstein & Co., Inc.	890
Poel & Kelly, Inc.	190
Raw Products Co.	67
Rogers Brown & Crocker Bros., Inc.	*300
Rogers Brown & Crocker Bros., Inc.	558
Charles T. Wilson Co., Inc.	578
MAY 7. By "American Trader," Europe.	
H. A. Astlett & Co.	402
MAY 7. By "Caronia," Liverpool.	
Baird Rubber & Trading Co., Inc.	32
General Rubber Co.	1,092
The Meyer & Brown Corp.	63
MAY 8. By "Minnekahda," London.	
Baird Rubber & Trading Co., Inc.	1,506
Bierrie & Co., Inc.	763
General Rubber Co.	214
The Meyer & Brown Corp.	498
Poel & Kelly, Inc.	481
Charles T. Wilson Co., Inc.	1,169
MAY 12. By "Veendam," Europe.	
Littlejohn & Co., Inc.	262
MAY 14. By "Algic," Far East.	
Hood Rubber Co.	*170
MAY 14. By "Minnewaska," London.	
Baird Rubber & Trading Co., Inc.	5,680
Bierrie & Co., Inc.	1,150
General Rubber Co.	50
Littlejohn & Co., Inc.	2,163
The Meyer & Brown Corp.	1,225
H. Muehlstein & Co., Inc.	141
Charles T. Wilson Co., Inc.	761
MAY 14. By "Pres. Adams," Far East.	
Baird Rubber & Trading Co., Inc.	395
General Rubber Co.	1,508
Littlejohn & Co., Inc.	830
The Meyer & Brown Corp.	875
The Meyer & Brown Corp.	*100
H. Muehlstein & Co., Inc.	138
Rogers Brown & Crocker Bros., Inc.	277
MAY 14. By "Samaria," London.	
The Meyer & Brown Corp.	81
MAY 15. By "London Corporation," Far East.	
Poel & Kelly, Inc.	549
MAY 15. By "Mississippi," London.	
The Meyer & Brown Corp.	*256
Poel & Kelly, Inc.	*56
Rogers Brown & Crocker Bros., Inc.	*525
MAY 15. By "Steel Seafarer," Far East.	
Rogers Brown & Crocker Bros., Inc.	515

Africans

APRIL 17. By "Binnendijk," Antwerp.	
Hood Rubber Co.	*203
APRIL 28. By "McKeesport," Europe.	
Littlejohn & Co., Inc.	111
MAY 3. By "Bolivian," London.	
Hood Rubber Co.	*393
MAY 8. By "Coahoma County," Antwerp.	
Hood Rubber Co.	1,077
MAY 13. By "Samaria," Europe.	
Littlejohn & Co., Inc.	23

Balata

APRIL 23. By "Pancras," Brazil.	
Paul Bertuch & Co., Inc.	127

Rubber Latex

APRIL 17. By "Silver Maple," Far East.	
General Rubber Co.	gal. 63,773
MAY 16. By "Pres. Adams," Far East.	
Rogers Brown & Crocker Bros., Inc.	gal. *595

Guayule

APRIL 16. By "Brosund," Mexico.	
Continental Rubber Co. of New York...	1,753
APRIL 19. By "Tela," Mexico.	
Continental Rubber Co. of New York...	1,620
APRIL 24. By "Cauto," Mexico.	
Baird Rubber & Trading Co., Inc.	1,120
Continental Rubber Co. of New York...	1,839
MAY 2. By "Mexico," Mexico.	
Continental Rubber Co. of New York...	1,620
MAY 8. By "Panuco," Mexico.	
Continental Rubber Co. of New York...	1,803
MAY 8. By "Josey," Mexico.	
Continental Rubber Co. of New York...	560
MAY 14. By "Monterey," Mexico.	
Continental Rubber Co. of New York...	1,139
MAY 15. By "Norden," Mexico.	
Continental Rubber Co. of New York...	2,260

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases		Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
APRIL 18. By "Bernini," Brazil.						The Meyer & Brown Corp., pkgs.	101				
H. A. Astlett & Co., Inc.	146		43	73		May 7. By "Swinburne," Brazil.					
Littlejohn & Co., Inc.	7		150			H. A. Astlett & Co., Inc.	203		68	73	
The Meyer & Brown Corp., pkgs.	269					Paul Bertuch & Co., Inc.				146	
APRIL 24. By "Panacas," Brazil.						General Rubber Co., Inc.	85	1	102	37	24
H. A. Astlett & Co., Inc.	112	4	41	51		Littlejohn & Co., Inc.				44	
Paul Bertuch & Co., Inc.	156			179		May 14. By "Lalande," Brazil.					
General Rubber Co., Inc.	91	104	19	30	24	Paul Bertuch & Co., Inc.	344			50	
Littlejohn & Co., Inc.	54				*3	Littlejohn & Co., Inc.				34	
						The Meyer & Brown Corp., pkgs.	153				

‡Mixed. **Knapsack.

United States Crude and Waste Rubber Imports for 1928 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1928	1927	Balata	Miscellaneous	Waste
January	43,668	1,580	433	126	435	1	46,243	45,827	120	1,292	248
February	27,852	756	125	125	587		29,445	27,701	58	517	310
March	37,545	2,430	72	92	755		40,894	35,054	154	741	830
April	36,108	573	15	20	524		37,240	48,632	202	888	18
Total, four months, 1928	145,173	5,339	645	363	2,301	1	153,822		534	3,438	1,406
Total, four months, 1927	146,929	7,044	1,039	528	1,664	10	157,214		416	4,434	2,562

Compiled from statistics supplied by the Rubber Association of America, Inc.

World Rubber Production—Net Exports

	1927 Total	1928 Jan.	1928 Feb.	1928 Mar.	1928 Apr.
British Malaya:					
Gross exports	371,321	27,731	28,813	27,813	20,079
Imports	182,844	16,618	12,911	10,508	9,335
Net	188,477	11,113	15,902	17,305	10,694
Ceylon	55,356	4,352	4,353	3,460	
India and Burma	11,321	1,605	1,081	775	
Sarawak	10,923	842	667	645	630
B. N. Borneo	6,582	*500	*500	*500	*500
Siam	5,472	525	536	269	258
Java and Madura	55,297	4,851	4,052	3,999	
Sumatra East Coast	77,815	7,988	6,737	5,826	
Other N. E. Indies	142,171	11,360	8,635	9,690	
French Indo-China	8,645	720	723	613	
Amazon Valley	28,782	2,273	1,612	2,750	1,014
Other America	2,454	225	199	204	
Mexican Guayule	5,019	432	489	575	
Africa	8,160	368	582		
Total	606,474	47,154	46,094		

*Estimate.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Absorption—Net Imports

	1927 Total	1928 Jan.	1928 Feb.	1928 Mar.	1928 Apr.
Australia	9,490	802	616		
Belgium	6,491	589	599		
Canada	26,405	2,290	2,553	2,989	
Czechoslovakia	2,715	376	297		
Denmark	581	29	43	33	
Finland	795	78	48	78	
France	34,274	1,764	2,526		
Germany	38,892	2,485	2,984	3,521	
Italy	11,381	546	655		
Japan	20,521	1,361	1,258	1,707	
Netherlands	635	52	98	95	
Norway	623	65	67		
Russia	12,018	572	159		
Spain	2,055	335	296		
Sweden	2,225	89	149	184	
United Kingdom	60,248	1,921	3,143	3,179	2,280
United States	398,453	37,120	30,926	36,970	
United States (Guayule)	5,019	432	489	575	
Total	632,822	50,906	46,906		

—Excess of Exports over Imports.

Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Export Trade in Rubber Hose

The world export trade in rubber hose for 1927, estimated at 16,236,400 pounds, with a value of \$6,707,700, shows an increase of 9 per cent in volume compared to 14,898,400 pounds for 1926. The United States exported 44 per cent of the total volume and 40 per cent of the total value in 1927, her nearest rival being Germany with 22 per cent of the volume, followed by the United Kingdom with 13 per cent.

Inventory—Production—Shipments of Pneumatic Casings—Inner Tubes—Solid Tires—Rubber and Fabric Consumption

	High Pressure Pneumatic Casings			Fabric		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1927	21,527,278	21,733,962		766,581	1,198,549	
1928						
January	3,605,064	1,684,750	1,496,047	200,322	56,218	60,404
February	4,394,561	1,697,498	1,244,812	222,655	53,220	28,719
March	4,355,809*	1,564,346	1,302,644	235,673*	33,168	28,431
	High Pressure Inner Tubes			Balloon Inner Tubes		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1927	27,398,535	29,528,108		25,718,529	25,143,821	
1928						
January	5,328,071	1,669,894	2,014,744	4,408,235	2,411,124	2,539,535
February	5,941,626	1,949,539	1,470,668	5,046,021	3,221,756	2,602,362
March	6,071,983*	1,740,238	1,442,162	5,782,551*	3,683,017	2,856,342

	Balloon Casings			Solid and Cushion Tires		
	Inventory	Production	Total Shipments	Inventory	Production	Total Shipments
1927	26,037,452	25,111,903		558,030	558,007	
1928						
January	3,656,537	2,377,299	2,489,391	161,329	36,279	33,797
February	4,173,493	3,021,548	2,500,013	156,790	36,328	38,715
March	4,700,534*	3,516,480	2,967,476	156,424*	42,950	44,665

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires			Crude Rubber		
	Cotton Fabric Pounds			Pounds		
1927	177,979,818			463,661,466		
1928						
January	16,039,819			43,709,438		
February	16,923,607			46,468,050		
March	18,853,824			48,897,275		

*As of March 31, 1928.

Rubber Association figures representing 75 per cent of the industry.

Getting Optimum Tire Service

That tire manufacturers build much more service into casings than consumers usually obtain and largely through their own fault, has been strikingly demonstrated by a large bus company. Instead of trusting solely to drivers to handle tires economically, the company hired an expert to get from the tires the utmost efficiency. The result was that it got an average of 26,947 miles to each tire during 1927, and the tire mileage for the fleet, which had covered 7,213,706 tire miles in the year, had been increased 67 per cent over 1926. The first three months of 1928 have shown an increase of 96 per cent over the first quarter of 1926.

e

ic
ad

(ip-
49

404
19
331

(ip-
321
535
362
342

(ip-
007
797
715
565

s
(r
6
8
0
5

ngs
wn
ny.
ly,
ost
les
ich
sed
ave
.